ISSN 0253-4924

FOOD TECHNOLOGY Abstracts

Vol. 27 No. 5 May 1992

Central Food Technological Research Institute, Mysore
National Information System for Science and Technology
Department of Scientific and Industrial Research, New Delhi.

NATIONAL INFORMATION CENTRE FOR FOOD SCIENCE AND TECHNOLOGY

CFTRI, MYSORE - 570 013

The National Information Centre for Food Science and Technology (NICFOS), is a discipline oriented information service in Food Science, Technology and Nutrition. Set up in October 1977 at the Central Food Technological Research Institute (CFTRI), Mysore, it is one of the Sectoral Information Centres under the NISSAT of the Govt. of India, Dept. of Scientific and industrial Research.

NICFOS's services are generated by a band of professional specialists and backed up by reprographic, micrographic, printing and computer facility. Its services include publication of R & D and industry oriented current awarness services, answering technical inquries, reprography and training.

NICFOS BASE

The well-equipped Library of CFTRI with its collection going back to 1950 function as a clearing house for information on all aspects of food area. With its large collection of books, monographs, conference proceedings, bound volumes of periodicals, standards, patents, reports, theses, microforms and 600 current periodicals it can provide you with the latest information on any subject area of food. The library also serves as a training centre in different aspects of information handling and use besides guiding in setting up of new libraries in the area of food science and technology.

PHOTOCOPY (XEROX) OF PUBLISHED SCIENTIFIC/TECHNICAL ARTICLES

The National Information Centre for Food Science and Technology (NICFOS) at the Central Food Technological Research Institute, Mysore, has got a good collection of scientific and other periodicals collected over the years in the area of Biological Sciences. If any article is needed for reference work, we will supply one copy from our wealth of collections. The cost of providing the copies is Rs.2/- per page (minimum charge Rs.10.00). Please take advantage of this facility to overcome your problem in getting original articles.

All correspondences regarding these services should be addressed to:

The Area Co-ordinator

FOSTIS, CFTRI,

Mysore 570 013,

Karnataka, India.

FOOD TECHNOLOGY ABSTRACTS

Vol. 27 No. 5
May 1992

National Information Centre For Food Science And Technology
Central Food Technological Research Institute,
Mysore - 570 013, India

Compiled and Edited by

B. Vasu

C. S. Anita

Geetha Seetharam

Abstractors to FTA

AS	Author's Summary
BV	B. Vasu
CSA	C. S. Anita
GS	Geetha Seetharam
KAR	K. A. Ranganath
SD	S. Dhanaraj
SRA	S. R. Ananthnarayan
VKR	V. Krishnaswamy Rao

Computerisation and Database Creation

P. Manilal

C. S. Anita

B. Vasu

S. R. Ananthnarayan

Annual Subscription : Rs.250.00. US $ 85.00. Single Copy : Rs.25.00

CONTENTS

ABBREVIATIONS

A	ampere
AAS	atomic absorption Spectrometry
abstr.	abstract
ad lib.	ad libitum
ADP	adenosine diphosphate
Anon.	Anonymous
AOAC	Association of Official Analytical Chemists
approx.	approximately
atm	atmosphere
ATP	adenosine triphosphate
a_w	water activity
BHA	butylated hydroxyanisole
BHT	butylated hydroxytoluene
BOD	biological oxygen demand
b.p.	boiling point
Btu	British thermal unit
c-	centi- [as in cm, cm^2, cm^3]
cal	calorie
cd	candela
Ci	curie
CMC	carboxymethyl cellulose
COD	chemical oxygen demand
coeff.	coefficient
conc.	concentrated
concn.	concentration
cv.	cultivar
cwt	hundredweight
d-	deci-
DE	dextrose equivalent
detn.	determination
DFD	dark firm dry
diam.	diameter
dil.	dilute
DM	dry matter, Deutsche Mark
DNA	deoxyribonucleic acid(s)
dyn	dyne
E.	East, Eastern, etc
ECD.	electron capture detection
EDTA	ethylenediaminetetra acetic acid
Eh	oxidation-reduction potential
ELISA	enzyme-linked immunosorbent assay
f-	femto-[10^{-15}, as in fCi]
°F	degree Fahrenheit
FAO	Food and Agricultural Organization
FDA	Food and Drug Administration
FID	flame ionization detection
fl oz	fluid ounce
f.p.	freezing point
ft	foot, feet
g	gram
GC	gas chromatography
gn	gravity
gal	gallon
gf	gram-force
GLC	gas-liquid chromatography
h	hour
ha	hectare
HDPE	high density polyethylene
hl	hectolitre [100 l]
hp	horse power
HPLC	high performance/pressure liquid chromatography
HTST	high temperature short time
Hz	hertz [frequency cycle/s]
in	inch
IR	infrared
IU	international unit
J	joule
k-	kilo- [as in kcal, kg]
K	Kelvin
l	litre
lb	pound
lb	pound-force
LDPE	low density polyethylene
m-	milli- [as in mg, ml, mm]
m-equiv	milli-equivalent
m	molar concentration
M-	mega- [as in Mrad]
max.	maximum
min	minute [time]
min.	minimum
mol	mole
mol.wt	.molecular weight
m.p.	melting point
MPN	most probable number
MS	mass-spectrometry
n-	nano-[10^{-9}, as in nm]
N	Newton [kg m/s^2]
N.	North, Northern, normal concentration
NMR	nuclear magnetic resonance
NPU	net protein utilization
oz	ounce
p-	pico- [10^{-12}, as in pCi]
P	poise
p	probability
Pa	Pascal [N/m^2]
PAGE	polyacrylamide gel electrophoresis
PER	protein efficiency ratio
p.p.b.	parts per billion
p.p.m.	parts per million
PSE	pale soft exudative
PTFE	polytetrafluorethylene
PVC	polyvinyl chloride
PVDC	polyvinylidene chloride
qt	quart
R	rontgen
rad	rad or radian
ref.	reference(s)
rev/min	revolutions per minute
RH	relative humidity
RNA	ribonucleic acid(s)
S.	south, Southern, etc.
s.d.	standard deviation
SDS	sodium dedecylsulphate
s.e.	standard error
s	second [time]
SNF	solids-not-fat
sp.,spp.	species
sp.gr.	specific gravity
summ.	summary
Suppl.	Supplement
t	metric tonne
temp.	temperature
TLC	thin layer chromatography
TS	total solids
UHT	ultra-high temperature
UV	ultraviolet
V	volt
var.	variety
vol.	volume
v/v	volume/volume
w	watt
W.	West,Western,etc.
WHO	World Health Organization
w/v	weight/volume
wk	week
wt.	weight
yd	yard
yr	year
µ	micro-[as in g, m]
%:	per centum
>	greater than
≥	greater than or equal to; not less than
<	less than
≤	less than or equal to; not greater than

Chemical symbols are used for all elements.

ABBREVIATIONS FOR LANGUAGES

Language of text

Dutch	Nl
French	Fr
German	De
Italian	It
Japanese	Ja
Norwegian	No
spanish	Es
swedish	Sv

GENERAL

887

Grover (I) and Shashi Kanta. **Standardization of foods and nutrition messages for package delivery.** *Indian Journal of Nutrition and Dietetics* 28(1): 1991: 20-25

An attempt has been made to identify and standardize messages and submessages for Food and Nutrition package to disseminate at village level through field functionaries and beneficiaries. This study has identified and standardized 11 crucial messages and 27 submessages as a package to be disseminated regularly. GS

888

Dziezak (JD). **Getting savvy on sauces.** *Food Technology* 45(6): 1991: 84, 87

A brief account of different kinds of sauces such as aioli, bechamel sauce, bolognese sauce, bordelaise sauce, chutney, marinara sauce, pesto and salsa that can be used to dress up entrees and side-dish food products is covered in this article. CSA

889

Fulks (FT). **Total quality management.** *Food Technology* 45(6): 1991: 96, 98-101

This article discusses about an approach which management within any area of the food industry can use to build quality. Citrus industry-taking a serious look at quality, answering the question of 'whom' to involve in discussions on quality, implementing a total quality management policy (make total quality management a priority, eliminate barriers to effective communication, draft a mission statement), creating an environment that fosters total quality (improve the manufacturing facility, practice sound management principles, maintain an on-going awareness of plant problems, institute a system to measure results, implement effective personnel management methods, provide employee training programs) and implementation ensures customer satisfaction are dealt in this article. CSA

890

Galvin (PA). **Pasteurized salads using ingredient blend retain fresh flavour.** *Food Technology* 45(6): 1991: 110

Mayonat PS, a specialy formulated blend consisting of emulsifiers, stabilizers and thickners used to simplify the production of salad dressings for pasteurized salads are discussed. The blend is of neutral flavour and smell, contains no cholesterol and all the ingredients are GRAS. Sealed plastic cups or foil bags are ideal packages and a shelf-life of 6 months for salads pasteurized using the blend are recommended. CSA

891

Fellenz (DC) and Moppett (FK). **Browning agent enhances visual appeal of microwaved foods.** *Food Technology* 45(6): 1991: 111

Microwave browning agent develops a rich brown colour on food surfaces during microwave heating and it enhances the visual appeal of the product which is an important aspect of eating enjoyment. Browning agent has its potential applications in grain-flour-based baked foods, meats, cheese toppings and some vegetables. CSA

892

Norback (JP) and Rattunde (MAL). **Production planning when batching is part of the manufacturing sequence.** *Journal of Food Process Engineering* 14(2): 1991: 107-123

Batching is a routine part of food production, even in many manufacturing sequences which have continuous components. Determining the correct number of batches to be produced in the face of continuous demand for final product and multiple demands on the batches from many products is a computationally complex problem. An organizational and computational scheme for tracking the impact of the batching decision is presented. The structure provides means for determining resource use patterns and for costing those patterns for a given production plan. The data necessary to drive this system are the costs, the batch formulation and yields and the other resources required by the product. The scheme is suited for electronic computation and can be rendered in a straight forward way on a microcomputer. An example illustrating how the data are organized is provided. AS

FOOD PROCESSING

Nil

FOOD PACKAGING

893

Farber (JM). **Microbiological aspects of modified-atmosphere packaging technology - a review.** *Journal of Food Protection* 54(1): 1991: 58-70

A review article discusses the great vulnerability of modified-atm. packaged (MAP) foods from a safety standpoint is that with many modified atm. containing moderate to high levels of carbon dioxide, the aerobic spoilage microorganisms are inhibited, while the growth of pathogens may be allowed or even stimulated. The emergence of new psychrotrophic pathogens such as *Listeria monocytogenes*, *Aeromonas hydrophila* and *Yersinia enterocolitica*, new safety issues have been raised. A major emphasis of this review is on the effect of MAP on the growth and survival of foodborne pathogens. 115 references. BV

FOOD ENGINEERING AND EQUIPMENT

894

Lee (JH) and Singh (RK). **Particle residence time distributions in a model horizontal scraped surface heat exchanger.** *Journal of Food Process Engineering* 14(2): 1991: 125-146

Residence times and their distribution characteristics of potato cubes with aqueous solutions of sodium carboxymethyl cellulose (CMC), simulating non-Newtonian fluid foods, in a horizontal scraped surface heat exchanger (SSHE) were investigated. Min. and max. normalized particle residence times (NPRTs) and standard deviations of mean values were not significantly affected by the particle concn. while mean NPRTs of up to 10% particle concn. were significantly lower than those of 20 - 40% particle concn. ($P < 0.05$). Mean NPRTs were significantly influenced by process parameters including concn. of carrier, viz., viscosity, mutator speed and particle size ($P < 0.001$) as well as 2-way interactions among flow rate, mutator speed and particle size ($P < 0.05$ or 0.001). Furthermore, most of the individual particle residence time distributions in a horizontal SSHE flow could be described by either normal or γ distribution models. AS

895

Mihori (T), Watanabe (H) and Kaneko (S). **A control system for achieving correct heat sterilisation process. A one-dimensional approach to packaged conduction heating of foods.** *Journal of Food Processing Preservation* 15(2): 1991: 135-155

A procedure for on-line control system to achieve the correct heat sterilisation for conduction heating of food, consists of collection of series of time/temp. data to predict its relationship for the reminder for the heating phase and during cooling, integrates the lethal rate, and determines appropriate time to start cooling to achieve a desired process lethality. SD

ENERGY IN FOOD PROCESSING

Nil

FOOD CHEMISTRY AND ANALYSIS

896

Helwig (EJ) and Biber (HE). **The use of the scanning electron microscope in investigating container corrosion by canned foods and beverages.** *Food Microstructure* 9(3): 1990: 195-202

The scanning electron microscopy and energy dispersive X-ray micro-analysis play an important role in the study of corrosion e.g. stress corrosion cracking in packs of tuna and potatoes, pitting corrosion related to light coloured fruits and insufficient protection because of lacquer defects. SD

Chemistry

897

Akinpelu (OA). **Iron and copper uptake during the wet-milling of some Nigerian foods.** *Journal of Food Science and Technology (India)* 29(2): 1992: 108

Five food items, pepper, onion, tomato, fermented maize and dehulled cowpea, commonly wet-milled before further processing in Nigeria were milled with a commercially operated disc attrition mill for which the discs were made by local foundaries. The pH, moisture, Fe and Cu contents of the milled samples were determined using atomic absorption spectrophotometer for metal detn. The Fe content of the samples milled with a disc attrition mill was significantly higher than that of controls ($p < 0.01$) which measured the actual metal content of the samples while there was no significant uptake of Cu. AS

898

Tee (E-S) and Lim (C-L). **The analysis of carotenoids and retinoids. A review.** *Food Chemistry* 41(2): 1991: 147-193

The review defines the state-of-the-art of analytical methods for the study of carotenoids and retinoids particularly in foods and blood samples. Various preliminary sample treatment procedures, precaution to be taken during handling of samples and methods of separation and quantitation of these two groups of compounds are discussed in detail. 203 references. SD

899

Tokuoka (K) and Ishitani (T). **Minimium water activities for the growth of yeasts isolated from high-sugar foods.** *Journal of General and Applied Microbiology* 37(1): 1991: 111-119

Thirty five yeast strains isolated from high-sugar foods and related materials were determined for min. a_w needed for their growth. The min. a_w for growth of the yeasts depended on a_w controlling solutes as well as yeast sp. and strains. Most sp. showed the highest min. a_w for growth in NaCl-media and about half of the sp. showed the lowest min. a_w for growth in sucrose-media. One strain of *Zygosaccharomyces rouxii* had min. a_w for growth as low as 0.67 in fructose-media. Miso extract and koji extract rich in inositol, and casamino acid decreased min. a_w for growth of *Z. rouxii* in NaCl-media. Pre-incubation in the presence of high concn. of glucose and fructose also decreased min. a_w for growth of yeasts in glucose-media or fructose-media. BV

900

Cuq (JL) and Jaussan (V). **Caffeic acid oxidation and antibacterial effects.** *Sciences Des Aliments* 11(1): 1991: 25-36 (Fr)

The antibacterial effect of caffeic acid and of its oxidation derivatives was determined at pH 10 and under oxygen by HPLC. The bactericidal activity appears only after caffeic acid oxidation and in alkaline conditions. This effect can be the result of the condensation reaction between a quinone and the amino groups of lysine residues of bacterial proteins. BV

901

Pilkova (L), Pokorny (J) and Davidek (J). **Browning reactions of Heyns rearrangement products.** *Die Nahrung* 43(8): 1990: 759-764

The browning rate of HEYNS rearrangement products at 110 C under free access of oxygen is slower than that of AMADORI rearrangement products. The max. browning rate was observed at pH = 8.0. The browning was accelerated by Fe(III) and Cu(II) ions. The presence of Fe(II) ions, propyl gallate, and rutin caused lag phase but had no pronounced effect during the subsequent browning. Hydrogen peroxide bleached the melanodin pigments but did not destroy the browning precursors. Sulphites inhibited the browning reaction. Flourescence spectra differed from those of the respective AMADORI products. AS

FOOD MICROBIOLOGY AND HYGIENE

Microorganisms

902

Hoskin (JC) and Wright (RE). ***Cryptosporidium*: An emerging concern for the food industry.** *Journal of Food Protection* 54(1): 1991: 53-57

A review article highlighting the magnitude of the problem caused by *Cryptosporidium* in the food industry. *Cryptosporidium* is a protozoan producing infective oocysts causing human diarrhoea that is fatal under certain conditions. No drug or treatment regime has effected a cure of cryptosporidiosis in man or animals. Standard cleaning and sanitizing solutions are not effective against *Cryptosporidium*, but the oocysts are susceptible to heat and drying. Simple diagnostic tests for detection of oocysts in food materials are not devised. Testing procedure are needed for routing detection of *Cryptosporidium* in animal food products and potentially contaminated food products. 73 references. BV

Bacteria

903

Kent (RA), Stephens (RS) and Westland (JA). **Bacterial cellulose fiber provides an alternative for thickening and coating.** *Food Technology* 45(6): 1991: 108

The production of cellulon fiber, a form of bacterial cellulose with an aerobic fermentation of glucose and other nutrients using a selected strain of acetobacter, its strong hydrogen bonding and viscosity properties are discussed. The water binding ability of the cellulon fiber provides an improved quality of surimi-based products and adds whiteness to colour of surimi gel samples. CSA

Listeria monocytogenes

904

Ita (PS) and Hutkins (RW). **Intracellular pH and survival of *Listeria monocytogenes* Scott A in tryptic soy broth containing acetic, lactic, citric and hydrochloric acids.** *Journal of Food Protection* 54(1): 1991: 15-19

The effect of citric, acetic lactic and hydrochloric acids on the growth, survival and intracellular pH (pH_{in}) values of *Listeria monocytogenes* Scott A were determined in a pH-controlled fermentation vessel. For most acids *L. monocytogenes* grown in tryptic soy (plus yeast extract) broth survived even when the pH was reduced to 3.5. Although citric and lactic acids were more effective in lowering the pH_{in},

acetic acid had the greatest effect on cell survival. A greater than 4 log reduction in cell number occurred when *L. monocytogenes* was held in acetic acid-treated broth for 24 h at pH 3.5 even though the pH_{in} was 5.0. The results suggest that inhibition of *L. monocytogenes* by acids is caused not by a decrease in the intracellular pH, per se, but rather by specific effects of undissociated acid species on metabolic or other physiological activities. BV

Pseudomonas aeruginosa

905

Venkata Raman (K), Charyulu (NCLN) and Karanth (NG). **A mathematical model for the production of biosurfactants by *Pseudomonas aeruginosa* CFTR-6: Production of biomass.** *Journal of Chemical Technology and Biotechnology* 51(4): 1991: 525-538

The fermentation reaction producing biosurfactant using *Pseudomonas aeruginosa* CFTR-6 was studied. The progress of the bioreaction was monitored in terms of biomass production, product formation and substrate consumption in shake flask experiments using different initial sugar concn. A logistic model for biomass growth was found to be satisfactory. Av. estimates of the specific growth rate, biomass yield coeff. and maintenance coeff. were obtained. AS

Fungi

Mushrooms

906

Malizio (CJ) and Johnson (EA). **Evaluation of the botulism hazard from vacuum-packaged enoki mushrooms (*Flammulina velutipes*).** *Journal of Food Protection* 54(1): 1991: 20-21, 27

Flammulina velutipes, commonly known as the enoki or winter mushroom, is cultured aseptically in Japan and the United States and is vacuum-packaged in polyethylene film for retail sale. Because of the known potential hazard of botulism from agaric mushrooms that are packaged in plastic films, the safety of vacuum-packaged enokis was evaluated. Botulinal toxin was not detected by mouse assay in 148 packages from 14 independent lots when a rich medium containing trypticase-peptone-glucose-yeast extract, was added aseptically to the packages which were heat-shocked (60 or 80 C for 20 min) and incubated at 30 or 37 C. Botulinal toxin was produced when spores were added to the packages, but spoilage was evident prior to toxin formation. Toxin was not formed when the inoculated packages were kept refrigerated (6 C). The results indicate that fresh vacuum-packaged enoki mushrooms do not present a botulism hazard when cultured aseptically and stored refrigerated. AS

Rhizopus oryzae

907

Yu (R-C) and Hang (YD). **Purification and characterization of NAD-dependent lactate dehydrogenase from *Rhizopus oryzae*.** *Food Chemistry* 41(2): 1991: 219-225

The enzyme NAD-dependent lactate dehydrogenase, purified by ammonium sulphate fractionation and polybuffer exchanger 94 chromatofocusing, had a specific activity of > 15 units/mg protein and its sodium dodecylsulphate-polyacrylamide gel electrophoresis pattern showed only one protein band. The mol. wt. of native enzyme was 131000 daltons and that of subunit 36000 daltons. The purified enzyme was stable at room temp., with pH about 7.5 and isoelectric point about 5.2. The k_m values for NADH, pyruvate and 2-oxobutyrate were 1.48, 6.40 and 54.4 x 10^{-4} M, resp. Activity was inhibited by Cd^{2+}, Fe^{2+}, Hg^{2+}, Pb^{2+} and Zn^{2+} but not by EDTA. SD

Yeasts

908

Peddie (FL), Simpson (WJ), Kara (BV), Robertson (SC) and Hammond (JRM). **Measurement of endogenous oxygen uptake rates of brewers' yeasts.** *Journal of the Institute of Brewing* 97(1): 1991: 21-25

The oxygen requirement of brewers' yeast varies with both the yeast strain and the physiological condition of the yeast and it has been suggested that an estimate of the amount required can be obtained from yeast oxygen uptake values (qO_2). Using two techniques (a batch aeration method and a continuous aeration method) it has been shown that the qO_2 value can change with time during the evaluation, due to physiological changes in the yeast. Since an assessment of the oxygen requirement is dependent on a representative measurement of qO_2 value, tests designed to estimate this parameter should incorporate the following features: (i) access of the yeast to oxygen should be restricted during sampling and at all times prior to analysis, (ii) qO_2 measurements should be made immediately before the yeast is pitched in the brewery, (iii) qO_2 value should be expressed on a per cell basis in order to eliminate the need for (time consuming) dry wt. detn. Time dependent changes in qO_2 values, which take place during the assay, can affect the precision of the test results. It has

been found that the use of high concn. of cells (1 - 2 g dry wt. Litre^{-1}) reduces this error. AS

909

Sheehan (CA), Weiss (AS), Newsom (IA), Flint (V) and O'Donnell (DC). **Brewing yeast identification and chromosome analysis using high resolution CHEF gel electrophoresis.** *Journal of the Institute of Brewing* 97(3): 1991: 163-167

Contour-clamped homogeneous electric field (CHEF) gel electrophoresis has been used to study the karyotypes of a range of *Saccharomyces cerevisiae* yeast strains. The time required from sampling yeast cultures to CHEF analysis was achieved within 6 h, making this procedure very useful in reference and quality control work in the brewing industry. Regions of the chromosome profiles were closely studied by adjusting electrophoresis conditions to increase resolution between bands. Both ALE and lager strains of brewing yeasts were studied along side haploid laboratory strains. By comparing different regions of the profiles even very closely related strains of lager yeast could be distinguished. Brewing strains consistently had significantly more chromosome bands than haploid laboratory strains. The electrophoretic karyotypes of brewing yeasts were represented as groups of bands on CHEF gels which apparently comigrated with their haploid chromosomal counterparts. AS

Hansenula anomala

910

Bellinger (Y) and Larher (F). **Salt tolerance and osmolyte composition of the yeast *Hansenula anomala* grown in the presence of fermentable or non-fermentable sources of carbon.** *Sciences Des Aliments* 11(1): 1991: 37-48

Hygiene

911

Sperber (WH). **The modern HACCP system.** *Food Technology* 45(6): 1991: 116, 118, 120

This article describes the recent improvements in the Hazard Analysis and Critical Control Point (HACCP) system. Aspects covered are the evolution of HACCP, HACCP principles (conduct hazard analysis and risk assessment, determine CCPs, establish specifications for each CCP, monitor each CCP, establish corrective action to be taken if a deviation occurs at a CCP, establish a record keeping system, establish verification procedures), hazard analysis and risk assessment (food intended for consumption by at-risk population, product contains sensitive ingredient, no process step to eliminate hazard, recontamination potential before packaging, potential for product abuse, no terminal heat process), Pillsbury's hazard control plan and benefits. CSA

912

Kalish (F). **Extending the HACCP concept to product distribution.** *Food Technology* 45(6): 1991: 119-120

This article deals with the application of Hazard Analysis abd Critical Control Point (HACCP) concept to the distribution of refrigerated juices. Different programs implemented has shown that the consumer complaints about the quality which has reduced by 40%. Proper product handling procedures to maintain high-quality products are also discussed. CSA

913

Daniels (RW). **Applying HACCP to new-generation refrigerated foods at retail and beyond.** *Food Technology* 45(6): 1991: 122, 124

Audits of temp. abuse of extended shelf-life refrigerated foods in supermarkets and homes illustrate opportunities such as improved refrigeration equipment, increased sales of thermometers and sanitizers for use in home refrigerators, new distribution systems, modified manufacturing programs, small-company opportunities, and new retailing approaches to apply Hazard Analysis and Critical Control Point programs. CSA

914

Beard (TDIII). **HACCP and the home: The need for consumer education.** *Food Technology* 45(6): 1991: 123-124

Unfamiliarity and expectations of the food products, price, defects and consumer mishandling are the causes for consumer dissatisfaction. Complete product satisfaction could be achieved only when the consumers are educated about the food handling practices such as checking containers at the store, handling the product properly on the way home, storing ingredients and foods properly, preparing food properly, keeping kitchen equipment hygenically clean, maintaining personal hygiene, storing prepared foods properly and managing pantries properly. Hazard Analysis and Critical Control Point system is one approach to take toward this resolution. CSA

915
Tisler (JM). **The food and drug administration's perspective on HACCP.** *Food Technology* 45(6): 1991: 125-127

The aim of the Food and Drug Adminstration to use Hazard Analysis and Critical Control Point system as an inspection tool to assure that only safe, high-quality, properly labeled and only legally acceptable food products are made available in the marketplace are discussed. CSA

916
Scarlett (T). **An HACCP approach to product liability.** *Food Technology* 45(6): 1991: 128, 133-134

This article discusses the evolution of the liability rules, the current product liability law, how rules relate with the HACCP system which is a quality control management technique that emphasizes on the identification of the mistakes during manufacturing process that can adversely affect the safety of food product and the development of specific methods to prevent the mistakes from happening. CSA

BIOTECHNOLOGY

Nil

TISSUE CULTURE

Nil

FOOD ADDITIVES

917
Akermann (O), Wolff (N) and Riquet (AM). **Electron spin resonance study of the influence of shape and polarity of molecules on their absorption in crystal polystyrene: Nitroxides used as simulants of food components.** *Sciences Des Aliments* 11(1): 1991: 125-140

Antioxidants

BHT

918
Steiner (I). **Chemical investigations of oxidized butyl hydroxy toluene (BHT).** *Deutsche Lebensmittel-Rundschau* 87(1): 1991: 11-17 (De)

2,6-Di-tert-butyl-4-phenol (BHT) is often added as antioxidant for plastics used for the production of packaging materials for food stuffs. Sterilizing these materials e.g. with ozone BHT is oxidized to various substances. Compounds with peroxide groups, chinoic compounds, carbonic acids and keto acids were found by HPTLC and IR methods. A ketone, benzenone, two hydroquinones, and acid and two derivatives of furane were identified by GC/MS. A negative influence on flavour and taste of foodstuffs by these substances is possible. AS

Sweeteners

Aspartame

919
Keller (SE), Fellows (JW), Nash (TC) and Shazer (WH). **Application of bulk-free process in aspartame-sweetened frozen desert.** *Food Technology* 45(6): 1991: 106

A process developed for producing an aspartame-sweetened frozen dairy desert made without bulking agents and which would exhibit textural properties similar to those products containing bulking agents or sugar is described. The process uses the enzyme β-galactosidase (lactase) which allows increased milk solids nonfat (MSNF) levels in the desert. Sensory analysis to determine the utility of the enzyme treatment is conducted. The results show that increased MSNF and lactase facilitate the successful production of an aspartame-sweetened frozen dairy dessert without the addition of bulking agents. CSA

CEREALS

920
Bechtel (DB). **Preparation of cereals and grain products for transmission electron microscopy.** *Food Microstructure* 9(3): 1990: 241-251

This paper provides information on the preparation of cereals and cereal based products for microscopic analysis avoiding technical problems viz. sample treatment, chemical and physical fixation, dehydration, embedding, sectioning techniques, immunocytochemistry, enzymatic digestions, carbohydrate localization and lectin binding. SD

921
Munzing (K) and Bolling (H). **Microcalorimetic presentation of phase transitions and structure modifications in cereal starches.** *Getreide-Mehl und Brot* 44(5): 1990: 131-138 (De)

922

Benzing (L). **Possibilities for controlling insects in cereal based food.** *Getreide-Mehl und Brot* 44(5): 1990: 157-159 (De)

Barley

923

Bhatty (RS), MacGregor (AW) and Rossnagel (BG). **Total and acid-soluble β-glucan content of hulless barley and its relationship to acid-extract viscosity.** *Cereal Chemistry* 68(3): 1991: 221-227

The relationship between total and acid-soluble β-glucan and acid extract viscosity (AEV) was investigated in 13 genotypes of barley (12 hulless and one hulled low β-glucan mutant for comparison). The range in AEV was 3.0 - 145.5 cS; in total β-glucan, 3.9 - 5.4%. AEV was correlated (+0.83, $P < 0.01$) with total β-glucan percentage but with none of the other components of barley measured, such as starch, protein, pentosans, or their constituent sugars (arabinose and xylose). The acid-soluble fraction of barley contained 1.0 - 2.7% β-glucan, 0.8 - 2.7% starch, 1.6 - 2.2% nitrogen, and 0.2 - 0.6% pentosans (determined by GC), representing an av. of 44.7, 2.4, 81.8 and 14.8% resp., of their concn. in the grain. Thus, besides β-glucan, the major components of the acid-soluble fraction were nitrogen and pentosans. The correlations between AEV and soluble β-glucan, starch, and pentosans were +0.71, $P < 0.01$, +0.90, $P < 0.01$ and +0.61, $P < 0.05$, resp. The positive correlation between AEV and soluble starch seemed coincidental, as the the latter contributed very little to AEV; viscosities of acid extracts of three genotypes of barley containing 0.9 - 2.7% starch were completely abolished in 15 min on addition of β-glucanase to the extracts. Earlier addition of protease and α-amylase to an acid extract of one genotype of barley did not lower viscosity significantly, but the viscosity was lowered by the addition of xylanase, a pentosan-hydrolyzing enzyme. The present data confirm that soluble β-glucan is largely, and pentosans are to a minor extent, responsible to AEV in spite of AEV's large variability in genotypes of hulless barley. AS

924

Roberts (CA), Marquardt (RR), Frohlich (AA), McGraw (RL), Rotter (RG), Henning (JC). **Chemical and spectral quantification of mold in contaminated barley.** *Cereal Chemistry* 68(3): 1991: 272-275

This work was conducted to estimate mold in barley by N-acetyl-D-glucosamine determined by ion-exchange chromatography and near-infrared reflectance spectroscopy (NIRS). In one study, barley fungal contamination was assessed visually using a scale of 0 (no mycelia or spores) to 5 (prolific mycelial growth or spore production). The contaminated barley was then analyzed for glucosamine using ion-exchange chromatography. Glucosamine correlated highly ($P < 0.01$) with mycelia and spores; correlation coeff. were 0.86 and 0.85, resp. Glucosamine was quantified by NIRS; coeff. of detn. for calibration and performance exceeded 0.92. In a second study, a population of artificially contaminated barley was created by mixing mycelial dry matter with noncontaminated barley. Mycelial tissue in these samples was quantified by NIRS; the performance coeff. of detn. was 0.94. Based on results with naturally incubated samples, it was concluded that glucosamine determined by ion-exchange chromatography represented fungal cotnamination in barley and that it could be determined by NIRS. Based on the successful artificial calibration, it was concluded that mycelia at naturally occurring levels could be quantified by NIRS and that NIR spectrophotometers can detect mycelia directly, despite the empirical nature of NIRS technology. AS

925

Marlett (JA). **Dietary fiber content and effect of processing on two barley varieties.** *Cereal Foods World* 36(7): 1991: 576-578

Three barleys that had each been processed into a ready-to-eat (RTE) cereal product and one unprocessed barley were analyzed for soluble and insoluble dietary fiber content and composition. The total fiber differed between the unprocessed and processed barleys, 15.7 vs 12.2 - 12.4% (dry wt.), although their total contents of (1-3), (1-4)-β-D-glucan were the same - 5.1 and 4.8 - 5.4%, respectively. Neutral sugars in the insoluble fiber were reduced by processing, from 8.5% to an av. of 4.1% of the original sample dry wt. Of the β-glucan and total fiber in the processed barleys, greater than or equal to 90 and 48 - 57%, resp., were extracted into the soluble fiber fraction, in contrast to 73 and 31% from the unprocessed sample. These results suggest that processing barley into an RTE cereal product increased the analytical solubility of dietary fiber. The insoluble neutral sugar content was probably decreased as a result of pearling. AS

926

Henry (RJ). **Quantitation analysis of barley (1->3), (1->4)-β-glucanase isoenzymes by high-performance liquid chromatography.** *Journal of Cereal Science* 12(2): 1990: 187-192

The isoenzymes of (1->3),(1->4)-β-glucanase (EC 3.2.1.73) from malting barley were separated by high

performance cation-exchange chromatography. Separation was achieved in less than 20 min with high recoveries of enzyme activity. Isoenzyme 1 was the major component (63 - 82% of the total) after steeping and 48 h of germination suggesting that this isoenzyme may be the most important in determining the rate of modification. In a comparison of samples of 4 different var. Grimmett, with the highest level of modification, also had the highest amount of isoenzyme 1. However, the var. Ronald apparently achieved higher modification than Bandulla by having more of enzyme 2, indicating that total β-glucanase activity determined the rate of modification. The var., Peyote, had the lowest level of enzyme 1 and total β-glucanase. Only isoenzyme 2 could be detected in kilned malt. AS

Oats

927

Anderson (JW), Hamilton (CC), Horn (JL), Spencer (DB), Dillon (DW), Zeigler (JA). **Metabolite effects of insoluble oat fiber on lean men with type II diabetes.** *Cereal Chemistry* 68(3): 1991: 291-294

This study examines the safety, tolerance and metabolic effects of insoluble oat fiber in a hospital and an ambulatory setting for men with type II diabetes. Eight lean men with non-insulin-dependent (type II) diabetes fed a traditional diabetes diet for 1 wk, followed by a control diet plus 30 g/day of insoluble oat-fiber for 2 wk in a hospital metabolic ward. The subjects resumed their normal diet + 30 g/day of insoluble oat fiber for an additional 10 wk. The hospital oat-fiber diet decreased fasting serum glucose (FSG) levels by 13% ($P < 0.05$), low-density lipoprotein cholesterol (LDL-C) by 8.9% ($P < 0.05$), and apolipoprotein B-100 by 17% ($P < 0.01$). Other serum lipid levels did not change significantly, and values returned to pretreatment levels during the ambulatory phase. This study suggests that an insoluble oat-fiber may have a beneficial effect on FSG and LDL-C levels in persons with type II diabetes. BV

928

Vollendorf (NW) and Marlett (JA). **Dietary fiber methodology and composition of oat groats, bran and hulls.** *Cereal Foods World* 36(7): 1991: 565-570

This review summarises and compares the results of oat fiber measurements from several methods of dietary fiber analysis. Measurement of dietary fiber (gravimetric methods, chemical methods, recovery of solubilized fiber, soluble and insolube fractions, classes of chemical components and assay for β-glucans) dietary fiber in oat groats, oat bran and oat hulls are discussed in this review. 37 references. BV

Oat bran

929

Williams (PC), Cordeiro (HM) and Harnden (MFT). **Analysis of oat bran products by near-infrared reflectance spectroscopy.** *Cereal Foods World* 36(7): 1991: 571-574

Samples of commercially prepared oat bran were obtained from 4 oat milling companies and used to develop calibrations for soluble, insoluble and total dietary fiber, protein and starch using a near-infrared reflectance (NIR) scanning spectrophotometer. The Mongeau method was used as reference method for the fiber components. Calibration were developed using conventional regression and regressions involving principal component analysis (PCA) and partial least squares (PLS). Accuracy and precision of NIR predictions were adequate for quality assurance for all five constituents. Conventional and PCA/PLS regressions were not significantly different from each other in their ability to provide satisfactory calibrations. The weightings computed during development of PCA/PLS regressions may be useful in providing information about the factors affecting variance in composition. AS

Rice

930

Dziezak (JD). **Romancing the kernel. A salute to rice varieties.** *Food Technology* 45(6): 1991: 74-78, 80

This article covers different forms of rice (brown rice, parboiled or converted rice, regular milled rice, pre-cooked rice) and the means used for classifying rice into long, medium and short-grain var. are discussed. Formulations provided by chefs are included to illustrate how some of the more unusual rice var. can be used to develop innovative products. Specially rices such as arborio rice, basmati rice, jasmine rice, sweet glutinous rice and wehani rice are also dealt. CSA

931

Champagne (ET), Hron (RJSr) and Abraham (G). **Stabilizing brown rice products by aqueous ethanol extraction.** *Cereal Chemistry* 68(3): 1991: 267-271

Brown rice (BR) kernels extracted with aqueous ethanol (EtOH) (95%, v/v) at room temp. (RT) (40 C approx.) lost less than 3% of the oil whereas

extraction at 70 C removed 15% of the oil. Thiamin retention was 91 and 37% in kernels extracted with EtOH at RT and 70 C resp. Little or no loss of protein, dietary fiber, carbohydrates, or minerals occurred in the extracted kernels. EtOH extraction decreased the microbial flora of the rice to very low levels and at RT or 70 C stabilised brown rice kernels to lipolysis. Flour prepared from kernels extracted with EtOH at 70 C was more stable to lipolysis. BR kernels extracted with EtOH at 70 C were susceptible to oxidative rancidity. BV

932

Juliano (BO), Hussain (A), Resurreccion (AP) and Bushuk (W). **Interference of phytate with extraction of protein from brown rice using 5M acetic acid.** *Cereal Chemistry* 68(3): 1991: 317-318

Patterns of 5M acetic acid extracts of milled and brown rices, obtained by aluminum-lactate (AL) polyacrylamide gel electrophoresis (PAGE) and reversed-phase HPLC, showed the presence of major glutelin proteins in milled rice that were absent in brown rice. Phytate in the bran fraction was shown to selectively bind glutelin in 5M acetic acid, since adding 1% sodium phytate to milled rice before extraction by acetic acid resulted in loss of some of the PAGE bands. Extraction of brown rice by 0.1M sodium acetate buffer pH 5 to remove unbound phytate before extraction of protein by acetic acid resulted in an AL-PAGE pattern similar to that of milled rice. AS

933

Horikoshi (M), Kobayashi (H), Yamazoe (Y), Mikami (B) and Morita (Y). **Purification and complete amino acid sequence of a major prolamin of rice endosperm.** *Journal of Cereal Science* 14(1): 1991: 1-14

Rye

934

Mano (Y), Nishiyama (S), Kojima (M), Ohnishi (M) and Ito (S). **Analysis of the molecular species of glycerolipids from rye grains by reversed-phase high-performance liquid chromatography.** *Cereal Chemistry* 68(3): 1991: 280-284

Rye protein

935

Tatham (AS) and Shewry (PR). **Conformational analysis of the secalin storage protein of rye (*Secale cereale* L.).** *Journal of Cereal Science* 14(1): 1991: 15-23

Triticale

936

Kulshrestha (K) and Usha (MS). **Biochemical composition and nutritional quality of triticale.** *Journal of Food Science and Technology (India)* 29(2): 1992: 109-110

Seven high yielding var. of triticale, namely 'Badger PM-118', 'UPT-72142', 'UPT-75182', 'UPT-76001', 'UPT-74304', 'UPT-7440' and 'UPT-75233' were analyzed for biochemical composition. Protein efficiency ratio (PER) of the highest yielding and highest protein containing var., 'UPT 72142', was determined. The protein (Nx5.7), Fe, Ca, P and riboflavin contents of the triticales were higher than those of Indian wheats. The triticales had a lower proportion of phytic Phosphorus than wheat. The PER of triticale chapathi indicated that it was superior to wheat chapathi. AS

Wheat

937

Shernaz Doongaji and Sabiha Vali. **Effect of wheat germ supplement to flour mixtures on growth, serum and liver proteins of weanling albino rats.** *Journal of Food Science and Technology (India)* 29(2): 1992: 125-126

Cereal flour mixture with the addition of wheat germ were fed to weanling albino rats at 10% protein level. Diets with 1:1 ratio of flour to wheat germ promoted max. wt. gain and PER. No significant difference was observed in the total serum protein level of animals in experimental groups as compared to the casein fed group. The serum albumin level as well as the liver protein reflected a significant increase. It is concluded that wheat germ can be used as an effective supplement for improving the nutritive value of cereal flour mixtures. AS

938

Primard (S), Graybosch (R), Peterson (CJ) and Lee (J-H). **Relationship between gluten protein composition and quality characteristics in four populations of high-protein, hard red winter wheat.** *Cereal Chemistry* 68(3): 1991: 305-312

939

Westerlund (E), Andersson (R), Hamalainen (M) and Aman (P). **Principal component analysis - an efficient tool for selection of wheat samples with wide variation in properties.** *Journal of Cereal Science* 14(1): 1991: 95-104

940

Pena (RJ), Amaya (A), Rajaram (S) and Mujeeb-Kazi (A). **Variation in quality characteristics**

associated with some spring 1B/1R translocation wheats. *Journal of Cereal Science* 12(2): 1990: 105-112

Advanced lines (295) from CIMMYT's International Bread Wheat Screening Nursery, a large proportion of which carry the 1B/1R translocation, were examined in terms of their sodium dodecyl sulphate (SDS)-sedimentation volumes and Alveograph characteristics, as well as their dough mixing and breadmaking properties. A significant quality trait variability was observed for all parameters evaluated. Comparison of sister lines with and without the 1B/1R translocation showed that variations in SDS-sedimentation volume, Alveograph characteristics, dough mixing and baking properties cannot be attributed exclusively to the presence of the 1B/1R translocation. Finally, the poor breadmaking properties, particluarly dough stickiness associated with one Mexican (Glennson 81) and two Australian (QT-2870 and SUN-89D) cv could not be confirmed when doughs were mixed under medium-speed mixing conditions. Therefore, the dough stickiness problem seems to be an attribute restricted mainly to high-speed mixing conditions characteristic of some modern breadmaking processes. AS

941

Dhaliwal (AS) and MacRitchie (F). **Contribution of protein fractions to dough handling properties of wheat-rye translocation cultivars.** *Journal of Cereal Science* 12(2): 1990: 113-122

942

Sutton (KH), Hay (RL), Mouat (CH) and Griffin (WB). **The influence of environment, milling and blending on assessment of the potential breadmaking quality of wheat by RP-HPLC of glutenin subunits.** *Journal of Cereal Science* 12(2): 1990: 145-153

The relationship between specific glutenin protein fractions quantified by reversed-phase high performance liquid chromatography (RP-HPLC) and the baking performance of samples has been investigated further. Loaf volumes and overall breadmaking quality (bake score) in an optimized MDD test baking procedure were predicted for 234 samples using regression equations developed previously. These samples represented var. from New Zealand and overseas. They were grown in many locations (in New Zealand and Australia) and over several seasons. Flours from wheats possessing the rye 1B/1R gene-translocation and commercial flour grists (blends) were also studied. The predicted baking performance results from RP-HPLC had smaller sums-of-squares of errors than models based on grain protein content. The confidence limits for baking performance prediction allow the distinction between poor and good quality flour to be made easily. AS

943

Dhaliwal (AS), Mares (DJ) and Marshall (DR). **Measurement of dough surface stickiness associated with the 1B/1R chromosome translocation in bread wheats.** *Journal of Cereal Science* 12(2): 1990: 165-175

944

Hakansson (B) and Jagerstad (M). **The effect of thermal inactivation of lipoxygenase on the stability of vitamin E in wheat.** *Journal of Cereal Science* 12(2): 1990: 177-185

Less than 10% of the vitamin E in wholemeal and white wheat flours was retained after drum-drying. This extensive destruction of vitamin E may be due to lipid degradation. It is known that tocopherols are oxidized by the co-oxidation reaction of lipoxygenase. The study showed that the loss of vitamin E started immediately on mixing the flour with water, which is the first stage in the drum-drying process. The loss increased as the storage time of the flours increased. It also increased as the temp. of the flour-water slurry increased, even though lipoxygenase activity was inactivated in the hot slurries. When lipoxygenase was heat-inactivated by low moisture processes, such as steam flaking and microwave-treatment, vitamin E retention was improved. The extent of the vitamin E losses can be ascribed to enzymic or non-enzymic oxidation is not known. Both mechanisms seems to be important. Non-enzymic lipid oxidation was favoured by a two- to five-fold increase in pro-oxidative substances, such as iron and copper, during the drum-drying process. AS

Wheat bran

945

Posner (ES). **Mechanical separation of a high dietary fiber fraction from wheat bran.** *Cereal Foods World* 36(7): 1991: 553-556

A process to separate two new fractions from wheat bran has been devised. The method involves fine grinding of coarse wheat bran followed by air classification. One fraction contains 60.8% TDF and 3.5 mg% phytate. By implementing this process, phytate was reduced from 5.7 mg%, a reduction of over 38%. The second fraction has high protein and mineral content. The high fiber fraction, with an av. particle size of 375 microns, was used with satisfactory results in bread baking and preparation of fried noodles at levels of 20% and 11.5% (flour basis), resp. AS

946

Sawant (BP), Bhuibhar (BW), Surve (VD), Sapre (DB) and Kanawade (LR). **Effect of premilling moisture content on selected characteristics of wheat flour.** *Indian Miller* 22(3): 1991: 11-13

Influence of premilling moisture content on fineness modulus av. particle size and uniformity index of wheat flour was studied using plate mill and hammer mill. It was observed that the fineness modulus increased from 2.34 to 3.15 in plate mill and 2.02 to 2.48 in hammer mill corresponding to increase in moisture content from 12.00 to 27.10% (w.b.). The av. particle size ranged from 0.53 to 0.92 mm in plate mill and from 0.42 to 0.58 mm in hammer mill with increase in moisture content from 12.00 to 27.10% (w.b.). The uniformity index ranged from 0:5:5 to 0:8:2 in plate mill and from 0:3:7 to 0:6:4 in hammer mill with increase in moisture content from 12.00 to 27.10%. There was no coarse fraction in the comminuted product. The relative proportion of medium fraction increased with moisture content in both mills producing less fines. SRA

947

Figueroa (JDC) and Khan (K). **The relationship of bromate requirement and sugars in breadmaking and implications for loaf volume potential of hard red spring wheat flours.** *Cereal Chemistry* 68(3): 1991: 284-290

948

Larsen (NG), Levick (SM), Mouat (CH) and Sutton (KH). **The effect of ball-milling on phospholipid extractability and the breadmaking quality of flour.** *Journal of Cereal Science* 12(2): 1990: 155-164

This paper describes the effect that ball-milling for various periods has on the mechanical dough development (MDD) breadmaking and physicochemical properties of flour. The quantity of water-saturated butanol-soluble phospholipid extractable from the flour at room temp. is negatively correlated with changes in loaf volume and positively correlated with MDD work input. However, this is an artefact of the starch damage caused by ball-milling. That is, phospholipid is acting as a marker for another variable and giving the false impression that a functional relationship may exist. Although there is an increase in protein solubility, wheat proteins analysed by reversed-phase high performance liquid chromatography (RP-HPLC) and polyacrylamide gel electrophoresis in the presence of sodium dodecylsulphate (SDS-PAGE) do not appear to be functionally altered by ball-milling. AS

Wheat protein

949

Ng (PKW) and Bushuk (W). **Model of glutenin structure based on farinograph and electrophoretic results.** *Cereal Chemistry* 68(3): 1991: 321-322

950

Sutton (KH). **Qualitative and quantitative variation among high molecular weight subunits of glutenin detected by reversed-phase high-performance liquid chromatography.** *Journal of Cereal Science* 14(1): 1991: 25-34

951

Masci (SM), Porceddu (E), Colaprico (G) and Lafiandra (D). **Comparison of the B and D subunits of glutenin encoded at the glu-D3 locus in two biotypes of the common wheat cultivar Newton with different technological characteristics.** *Journal of Cereal Science* 14(1): 1991: 35-46

952

Skerritt (JH), Frend (AJ), Robson (LG) and Greenwell (P). **Immunological homologies between wheat gluten and starch granule proteins.** *Journal of Cereal Science* 12(2): 1990: 123-136

Structural homologies between wheat (*Triticum aestivum* L.) gluten proteins and proteins present in well-washed starch granules were examined with a panel of mouse monoclonal and mouse and rabbit polyclonal antibodies, using immunoblotting, enzyme-linked immunosorbent assay (ELISA) and immunocytochemical methods. Many antibodies raised against gluten protein fractions cross-reacted with starch granule proteins (SGP), but often weakly. Antibodies with similar gliadin and glutenin subunit specificities had similar SGP specificities: (1) antibodies to high mobility (α-, β-, or γ-) gliadins cross-reacted weakly with low mol. wt. SGP (M_r 8000, 19000 and 30000) on immunoblots, and very weakly in indirect ELISAs. Some of these antibodies labelled both protein bodies and the periphery of starch granules in sections of immature grain, consistent with low mol. wt. SGP, deemed to be 'surface' SGP on the basis of extractability studies, indeed being present on the granule surface. (2) Monoclonal antibodies that bound γ and ω-gliadins and glutenin subunits bound to higher mol. wt. SGP, especially a protein of M_r 77000, at concn. only slightly above those which labelled gluten proteins. As the interior of the starch granule section was labelled, these proteins are likely to be 'integral' to

the granule. (3) Antibodies binding broadly to all major gluten protein classes also bound most high and low mol. wt. SGPs. Some starch proteins of M_r 15000, which have been associated with endosperm softness, appeared to be immunologically distinct. AS

953

Watterson (J), Shull (JM), Mohamed (AA), Reddy (V) and Kirleis (AW). **Isolation of a high-cysteine kafirin protein and its cross-reactivity with γ-zein antiserum.** *Journal of Cereal Science* 12(2): 1990: 137-144

Two methods were developed for the isolation of M_r 30k kafirin protein from immature sorghum, one involving direct extractions with 20% (v/v) 2-mercaptoethanol (2-ME) and the other involving extraction with 20% (v/v) 2-ME followed by reversed phase high performance liquid chromatography (RP-HPLC). The amino acid compositions of these isolated proteins were similar to each other and to a partially purified M_r 30 k kafirin from mature sorghum grain. These M_r 30k kafirins contained high levels of cysteine, proline and histidine, with low levels of aspartic acid and lysine. The mol. wt., solubility, amino acid composition of M_r 30k kafirin were similar to values published for maize γ-zein. Structural similarity between γ-zein and M_r 30k kafirin was demostrated through an immunological study showing cross-reactivity of the M_r 30k kafirin protein and a γ-zein antiserum. This high-cysteine M_r 30k kafirin protein was named γ-kafirin based on similarities in mol. wt., solubility and structure between it and γ-zein of maize. AS

Wheat starch

954

Chinachoti (P), Kim-Shin (M-S), Mari (F) and Lo (L). **Gelatinization of wheat starch in the presence of sucrose and sodium chloride: Correlation between gelatinization temperature and water mobility as determined by oxygen-17 nuclear magnetic resonance.** *Cereal Chemistry* 68(3): 1991: 245-248

MILLETS

955

Ansari (N) and Sankhla (N). **Effect of fluoride and bio-regulants on the activity of peroxidase in *Vigna aconitifolia* and *Sorghum vulgare*.** *Science and Culture* 57(5/6): 1991: 142-144

A significant increase in the activity of peroxidase was observed in the leaves and roots of *Vigna aconitifolia* and *Sorghum vulgare* following the treatment with fluoride. The highest concn. proved highly effective. A combination of fluoride and DKG additively increased the activity of peroxidase in Vigna seedlings. GS

Corn

956

Eckhoff (SR) and Tso (CC). **Wet milling of corn using gaseous SO_2 addition before steeping and the effect of lactic acid on steeping.** *Cereal Chemistry* 68(3): 1991: 248-251

Low-moisture corn kernels (Dekalb 636) were treated with gaseous SO_2 (0.1 and 0.2%) before steeping (6, 12, and 24 h) and compared with a standard 48 h control steep using the same SO_2 levels. Starch yields of the controls were not statistically different from those of the 12 h SO_2 steeps and were lower than those of the 24 h steeps. Brabender consistency was approx. 12% higher for the SO_2-treated samples at 12 h than for the controls. The 6 h SO_2-treated corn had higher Brabender consistencies, but starch yield decreased by approx. 3% at all treatment levels. Corns treated with 0.2% SO_2 showed increase in starch yields of 1.44, 2.08 and 2.35% for the 6-, 12- and 24-h steeps resp. Starch yields from 0.1% SO_2 + 0.55% lactic acid (added to steeping water) were greater than those from 0.2% SO_2 without lactic acid for all steep times. At the 0.1% treatment level, starch yields increased by 5.64, 4.96 and 4.44% for the 6-, 12- and 24-h steeps resp. BV

Corn flour

957

Cunningham (RL), Carr (ME) and Bagley (EB). **Polyurethane foams extended with corn flour.** *Cereal Chemistry* 68(3): 1991: 258-261

Five levels of unmodified corn flour (5, 10, 20, 30 and 40%, based on wt. of polyether polyol) were evaluated as fillers-extenders in rigid polyurethane foams. Densities of the flour-filled and control foams were similar (0.025 - 0.026 g/cm^3) except for the foams containing 10% flour (0.029 g/cm^3). The moisture in the flours at the various levels of addition appeared to have a significant effect on the structural formation of the foams. Force-deformation curves of foams with 5 and 10% flour were similar to those curves of the controls. Thermal conductivity of the foam filled with 10% flour was slightly lower (thus having greater insulating value) than were the values for the foam filled with 5% flour or the control foam (0.0232 versus 0.0242 W/m.K) (0.161 versus 0.168 BTU in./[ft^2.hr.^{o}F]). Foams containing 5 and 10% flour

did not increase more than 5% in vol. when subjected to thermal or humid conditions for 14 days. At the 40% level, foams expanded 14 and 16% under thermal and humid conditions, resp. after 14 days. AS

Corn meal

958

Lue (S), Hsieh (F) and Huff (HE). **Extrusion cooking of corn meal and sugar beet fiber: Effects on expansion properties, starch gelatinization, and dietary fiber content.** *Cereal Chemistry* 68(3): 1991: 227-234

This study investigates the effect of particle size of sugar beet dietary fiber on extrusion puffing: determines the insoluble dietary fiber (IDF), soluble dietary fiber (SDF) and total dietary fiber (TDF) content of extrudates: evaluated their total ungelatinized and gelatinized starch content and degree of gelatinization. Increasing the percentage of sugar beet dietary fiber resulted in less radial expansion and more elongation of the products. Decreasing the particle size of sugar beet fiber improved both radial and longitudinal expansion. Increased screw speed caused more elongation but decreased radial expansion. The starch in raw materials was completely gelatinized after extrusion regardless of the dietary fiber conent (0 - 30%). The IDF, SDF and TDF contents were not significantly different among extruded products containing 30% sugar beet fiber. IDF decreased by 0.6 - 1.7/100g of dry solid after extrusion cooking compared to the dietary fiber contents of the raw materials. The SDF increased slightly and TDF decreased slightly but the differences were not statistically significant. BV

Corn starch

959

Fanta (GF) and Christianson (DD). **Influence of poly (ethylene-co-acrylic acid) on the paste viscosity and gel rheology of corn starch dispersions.** *Cereal Chemistry* 68(3): 1991: 300-304

The rise in viscosity of aqueous starch suspensions during gelatinization was measured with a Brabender amylograph with and without poly (ethylene-co-acrylic acid) (EAA). Increases in paste viscosity were observed with as little EAA as 0.25 - 0.50 g/30 g of starch. EAA was added as a 5 - 10% solution in aqueous ammonium hydroxide, thus producing an alkaline pH during pasting. A similar but smaller increase in viscosity was also observed under near-neutral conditions, brought about by the removal of excess ammonia by evaporation. Gelatinization of starch in the presence of either poly (acrylic acid) or stearic acid caused no increase in viscosity; this is consistent with the theory that EAA increases viscosity by pseudocross-linking starch through formation of helical inclusion complexes with more than one starch macromolecule. Although EAA increases the paste viscosity of aqueous starch dispersions, it reduces the strength of gels formed from starch pastes. Scanning electron micrographs and Fourier transform infrared analyses for EAA suggest that EAA does not promote disruption of starch granules but complexes with starch that has already been solubilized by heating in water. AS

960

Eckhoff (SR) and Tso (CC). **Starch recovery from steeped corn grits as affected by drying temperature and added commercial protease.** *Cereal Chemistry* 68(3): 1991: 319-320

The application of commercial protease to corn dried at high and low temp. (HTD corn and LTD corn resp.) to investigate the effects on wet-milling properties and on the yield and quality of starch. The starch yield of HTD corn improved by more complete starch-fiber and starch gluten separations; but the starch yield of LTD corn only by better starch-fiber separation. High drying temp. result in low starch yield mainly because of the increased difficulty in starch-gluten separation, which also results in low quality of wet-milled products. BV

Sorghum

961

Dhingra (M), Srivastava (S) and Chauhan (GS). **Nutrient composition and relationship between physico-chemical and sensory qualities of sorghum genotypes.** *Journal of Food Science and Technology (India)* 29(2): 1992: 97-100

The content of amino acids, tannins and physico-chemical characteristics were estimated in 8 sorghum genotypes viz. 'CSV-10', 'CSV-11', 'SPV-386', 'SPV-736', 'UPFS-3', 'UPFS-11', 'P-37' and 'P-151'. The chapathies made from the flours of all the genotypes were evaluated for sensory properties. The genotypes 'UPFS-11' had the lowest leucine (0.63 g/100g) whereas 'P-151' had the highest. The max. lysine was observed in 'UPFS-3'. Tannins ranged from 48 ('SPV-736') to 336 mg/100g ('P-37'). Correlation studies revealed significant positive correlation between grain hardness and texture of chapathi. Amylose had significant positive correlation with overall acceptability of chapathi. AS

962

Shull (JM), Chandrashekar (A), Kirleis (AW) and Ejeta (G). **Development of sorghum (*Sorghum***

***bicolor* (L.) Monench) endosperm in varieties of varying hardness.** *Food Microstructure* 9(3): 1990: 253-267

Study on three sorghum var. with varying endosperm texture viz. hard, intermediate and soft revealed that the proportion of cells in the endosperm with a continuous protein matrix corresponded to the proportion of vitreous endosperm in the mature kernel. Even though the sequence of development was similar in all var., harder var. developed faster and the difference with the soft var. were visible as early as 15 DAHB. Hard var. had higher concn. of protein bodies than soft var. in the early stages of endosperm development. SD

PULSES

Cowpeas

963

Aremu (CY). **Selected physico-chemical properties of five varieties of cowpea.** *Food Chemistry* 41(2): 1991: 123-128

Five var. (Nigeria B7, Kano 1696, Vita 5, Farin Juda C and Ife Brown) of cowpea (*Vigna unguiculata*) showed varietal and/or seasonal variations in amylose, cooking time, swelling capacity and swelling time except in moisture and dry matter. A significant negative correlation ($r = -0.7$; $P < 0.02$) was established between amylose and swelling time during cooking. SD

Dry beans

964

Deshpande (SS) and Singh (RK). **Hemagglutinating activity of lectins in selected varieties of raw and processed dry beans.** *Journal of Food Processing Preservation* 15(2): 1991: 81-87

Serial dilution technique to study the effect of processing showed that lectin activity ranged 128 - 512 x 10^4 units/g of whole bean flour (307 x 10^4 av. units/g bean), small red and kidney beans had the highest hemagglutinating activities among the 10 var. of dry beans (*Phaseolus vulgaris* L.) and cooking of beans fully destroyed lectin activity. Dehulled beans showed no change and the germinated beans and protein conc. lower hemagglutinating activity. SD

Faba bean

Faba bean protein

965

Schneider (Ch) and Schmidt (G). **Some viscosity characteristics of faba bean protein isolates within a pH range relevant for foods.** *Die Nahrung* 34(8): 1990: 735-745

The rheological behaviour of concentrated aqueous dispersions of unmodified (FBPI-I) and acetylated (FBPI-II) faba bean (*Vicia faba* L. *minor*) protein isolates are investigated within a pH range of 4.0 up to 7.5. Besides the fact that equal concentrated dispersions of FBPI-I show a much lower apparent viscosity *n* than those prepared with FBPI-II, *n* and the flow behaviour index n depend also on the kind of preparation. Especially the direction of pH shifting and the mode of pH adjustment lead to marked differences of the rheological properties. In the case of FBPI-II dispersions a max. of *n* and n is shown at pH 5.5 to 6.5, seldom at pH 7.0, probably connected with a max. of the hydrodynamic vol. Holding the aqueous dispersions for 24 h caused mostly an increase of *n* and n. AS

966

Krause (J-P), Schultz (M) and Schmidt (G). **A method for the characterization of breakdown/reforming behaviour of faba bean protein dispersions.** *Die Nahrung* 34(8): 1990: 775-778

Lima bean

Lima bean starch

967

Hoover (R), Rorke (SC) and Martin (AM). **Isolation and characterization of lima bean (*Phaseolus lunatus*) starch.** *Journal of Food Biochemistry* 15(2): 1991: 117-136

Starch from large lima beans (*Phaesolus lunatus*) was isolated and some of the important characteristics determined. The yield of starch was 22% on a whole seed basis. The shape of the starch granules was round to oval to elliptical with granules 15 - 36 µm in diam. Scanning electron micrographs revealed presence of smooth surfaces. Gelatinization temp. range was 70 - 75 - 80 C and amylose content was 34.5%. The starch exhibited high single stage swelling and moderate solubility in water. The x-ray diffraction pattern was of the C-type. The viscoamylographic examination on starch paste (6%, w/v) showed the absence of a peak viscosity, a high 95 C viscosity (700 BU) and a breakdown in consistency (60 BU) during the 95 C holding cycle. Scanning electron microscopy

showed that native starch granules were very resistant to attack by procine pancreatic α-amylase. However, defatting slightly increased the extent of hydrolysis. The gel showed poor stability towards refrigerated storage and freeze-thaw cycling. The starch granules were highly resistant to acidic hydrolysis. AS

Navy bean

Navy bean flour

968

Lorimer (NL), Zabik (ME), Harte (JB), Stachiw (NC) and Ubersax (MA). **Effect of navy bean protein flour and navy bean globulin(s) on composite flour rheology, chemical bonding and microstructure.** *Cereal Chemistry* 68(3): 1991: 213-220

Substitution of 5 and 10% dry-roasted, air-classified high-protein flour (fines) for bread flour in farinograph studies increased absorption and lengthened arrival and peak times. The 10% level of substitution decreased stability. The globular proteins, phaseolin and G2 lectin, were separated from the navy bean fines and added to wheat dough systems in the same amounts as those in which they occurred in the 5 and 10% high-protein flour substitutions. Wheat starch was used to make up the remaining wt. Phaseolins and the combination of phaseolins and G2 lectins also increased absorption and arrival time, while decreasing departure time and dough stability. Investigation of the effect of phaseolin and G2 lectins on the rheologically active thiol and disulphides did not produce sufficient evidence to conclude that these globular proteins disrupted the disulphide interchange. Results of low-temp. scanning electron microscopy support the rheological studies. AS

Peas

969

Henderson (HM), Blank (G) and Sustackova (H). **Thermal inactivation of pea flour lipoxygenase.** *Journal of Food Biochemistry* 15(2): 1991: 107-115

Lipoxygenase (LOX) was determined in pea flour (9.6% moisture) samples which had been exposed to 90 - 130 C for 5 - 45 min, and in crude aqueous extracts (5%; pH 6.7) of previously unheated pea flour which had been exposed to 40 - 80 C for 5 - 30 min. The rate of thermal inactivation of pea LOX was shown to follow first-order reaction kinetics. The rate constants, k(min^{-1}), ranged from 0.005 to 0.252 for the flour, and from 0.068 to 0.267 (60 - 80 C) for the crude extract. The respective thermodynamic values were: for the energy of activation (E_a), 126.2 and 64.6 $kJmole^{-1}$; for the enthalpy of activation (ΔG^+), 123.1 and 61.8 $kJmole^{-1}$ for the energy of activation (ΔG^+), 118.0 and 101.4 $kJmole^{-1}$. The greater thermostability of LOX in the pea flour under dry-heat conditions, and the observed differences in the E_a, ΔH^+ and ΔS^+ values, may be accounted for by its possible complexation with other macromolecules and by the structure of the water surrounding the native enzyme. AS

OILSEEDS AND NUTS

970

Punjrath (JS), Devdhara (VD), Murthi (TN) and Aneja (RP). **Utilization of (edible grade) oilseed extractions for the manufacture of texturized dal analogues.** *Journal of the Oil Technologists Association of India* 23(1): 1991: 16-19

The extrusion process for commercial manufacture of texturized dal analogues for human consumption has been standardised. The optimum processing conditions are described. Dal analogues were prepared containing 20, 30 and 40 parts of edible defatted soy flours and the rest with maize flours. Experiments with flour blend containing 30 and 50% low-fat edible grade groundnut meal and the rest with maize flour were also carried out. Dal analogue with 0.6 ml/g bulk density, 16.3 to 23.5% protein was prepared from 30% soy flour or 50% low-fat groundnut meal. The protein content of dal analogues containing soy extractions increased from 15.1 to 23.8% as addition of the oilseed extraction increased from 20 to 40%. In groundnut, low-fat meal at 30 and 50% level of incorporation, the dal analogue had 16.3 to 23.5% protein. The bulk density of the soy product ranged from 0.4 to 0.8 g/ml and that of groundnut meal was 0.6 g/ml for both 30 and 50% groundnut products. The oil content of the product with defatted soy meal was 3.0 to 3.4% and with groundnut meal it was 3.8 to 6.4%. Fried Bengal gram had an oil content of 18.5% whereas protein content was 19.7%. The blends containing 30% defatted soy flour and that containing 30 and 50% low-fat groundnut flour gave dal analogues with bulk density close to each other. Max. expansion (texturization) of soy based analogue of 1.44 to 1.77 mm was obtained at 0.2% l/m water flow rate and max. expansion index of 1.42 to 1.55 was obtained at the same water flow rate for groundnut meal based products. Sensory evaluation dal analogues with 1.42 to 1.55 to 1.77 mm expansion index was acceptable in texture at 30% level of protein. At higher levels of soy flours (40%) the acceptability of the product was poor. SRA

Coconuts

971

Balachandran (C) and Arumughan (C). **Solubility and electrophoretic characteristics of proteins in different regions of coconut endosperm.** *Journal of Food Science and Technology (India)* 29(2): 1992: 91-96

A market concn. gradient in the increasing order was observed for proteins from the inner to the outer regions of coconut endosperm. The testa and coconut water showed lower levels of protein concn. However, non-protein nitrogen did not show any appreciable variation. Fractionation of proteins showed that more than 80% of the proteins from the different regions were soluble in aqueous and salt media. Solubility of the proteins in water and 5% NaCl (0.86 M) was determined in the pH range 1 to 10. The outer and testa regions showed different solubility characteristics both in aqueous and in salt media. Electrophoresis of the major albuminous and globular proteins showed the presence of 6 and 4 protein bands of mol. wt. ranging from 14,000 to 52,000 and 17,500 to 45,000 resp. The various regions from the inner to the outer had the same electrophoretic profile, but showed significant differences in their quantities with respect to the major and minor protein bands. However, the testa region showed max. variations for all the parameters studied. AS

Rapeseeds

972

Truscott (RJW) and Tholen (JT). **Total glucosinolate content in rapeseed using reflectance.** *FAT Science Technology* 92(7): 1990: 272-274

A method has been developed for the detn. of total glucosinolate content in rapeseed. Following selective hydrolysis of glucosinolates by the endogenous myrosinase in rapeseed, the glucose produced is detected with commercially available glucose test strips. The intensity of the colour on the strips is measured using a portable reflectometer. This method is suitable for use by plant breeders and for the detn. of glucosinolate content in commercial rapeseed loads. AS

973

Meshehdani (T), Pokorny (J), Davidek (J) and Panek (J). **The lipoxygenase activity of rapeseed.** *Die Nahrung* 34(8): 1990: 727-734

Zero-erucic rapeseed had both the lipoxygenase-I and lipoxygenase-II activity, both of which should be taken into account on storage of seeds. The lipoxygenase-II activity (the max. at pH = 6.5 - 6.8) is lower but the optimum pH is close to that of ground seed (pH = 6.3). The extent of lipoxygenase-catalyzed oxidation increased in presence of natural rapeseed lipids. The content of conjugated double bonds of lipid hydroperoxides produced as primary reaction products was in close linear relation with the content of total oxidized products determined by HPLC. The content of conjugated double bonds in defatted rapeseed meal containing addition of linoleic acid, linolenic acid, or methyl linoleate, resp., reached its max. in 3 - 6 min. There was great variability among the lipoxygenase activities of different rapeseed samples. AS

Soybeans

974

Sharma (YK) and Subramanian (N). **Nutritional evaluation of Kalitur (Glycine max.) protein and their major fractions.** *Indian Journal of Nutrition and Dietetics* 28(2): 1991: 41-45

Soybean (Glycine max.) var. Kalitur and Bragg (yellow var.) were evaluated for proteins and their major globular fractions 11S and 7S. The available lysine content of Kalitur and Bragg flour were 4.79 and 5.03% resp. of the total lysine content of 5.69 and 5.35% resp. The content of all the essential amino acids in Kalitur and Bragg flour proteins and their fractions were lower than that of egg protein. The essential amino acid content of 11S protein fraction of Kalitur and Bragg var. were 36.34 and 36.94 and the 7S protein fraction were 38.61 and 38.67% respectively. The chemical scores of proteins in the defatted flours of Kalitur and Bragg var. were 59.4 and 58.6 respectively. Kalitur 11S and 7S protein fractions had superior chemical score than Bragg var.: 69.47 as against 51.32 for the 11S protein fraction and 51.89 as against 42.78 for 7S protein fraction. GS

975

Om Kumar, Saikia (LB) and Kannur (SB). **Proximate and mineral composition of soybean seeds grown in North Eastern region.** *Journal of Food Science and Technology (India)* 29(2): 1992: 111-112

The proximate composition of the seeds of 12 var. of soybean viz., 'Kalitul' 'TS-74-24-2', 'T-49', 'PK-416', 'PK-472', 'PK-453', 'PB-1', 'PK-327', 'MACS-13', 'TS-73-16', 'Bragg' and 'Ankur' suggests that they are good sources of protein (32.35 to 37.56%), fat (18.76 to 206.92%), carbohydrates (25.02 to 31.51%), minerals (4.50 to 5.46%), and energy (429 to 440 Kcal/100 g). On ash fractionation, mineral content was found to be in the range of 0.48 to 0.61, 1.56 to 1.92, 0.024 to 0.063, 0.094 to 0.281, 0.352

to 0.733 and 0.0044 to 0.0163% for Na, K, Ca, Mg, P and Fe respectively. The soybean seeds are rich in Na, K and P contents. AS

976

Yamauchi (F), Yamagishi (T) and Iwabuchi (S). **Molecular understanding of heat-induced phenomena of soybean protein.** *Food Reviews International* 7(3): 1991: 283-322

This review covers chemical structure of soy proteins, heat denaturation of glycinin, β-conglycinin, conformational studies of native and denatured states of β-conglycinin. 116 references. BV

977

Taira (H). **Quality of soybeans for processed foods in Japan.** *JARQ (Japan Agricultural Research Quarterly)* 24(3): 1990: 224-230

This paper reviews the status of the quality of soybeans consumed in Japan in connection with the suitability in processing Japanese soybean products. Aspects covered include: quality for food processing (tofu, miso and natto), variation of the beans quality and its suitability for processing and factors inducing variations in the chemical composition. BV

Soy proteins

978

Fukushima (D). **Recent progress of soybean protein foods: Chemistry, technology and nutrition.** *Food Reviews International* 7(3): 1991: 323-351

This paper deals with the importance of the three-dimensional structures of soybean molecules in the technology of the traditional and non-traditional soybean protein foods, the recent progress in the nutrition and physiological function of soybean proteins, the application of a new biotechnology for traditional fermented soybean protein foods and the recent development for new soybean protein foods with original characters, in which soybean proteins are a main and key material. 29 references. SRA

TUBERS AND VEGETABLES

979

Kubo (Y), Inaba (A) and Nakamura (R). **Respiration and C_2H_4 production in various harvested crops held in CO_2-enriched atmospheres.** *Journal of the American Society for Horticultural Science* 115(6): 1990: 975-978

The respiration rate (O_2 uptake) and the rate of C_2H_4 production were measured before, during and after 24 h of treatment with 60% CO_2 (20% O_2) in 18 kinds of fruits and vegetables by use of an automated system connected to a microcomputer. High CO_2 decreased respiration only in climacteric fruit and broccoli, which were producing C_2H_4. Ehtylene production decreased with CO_2 treatment of peaches, tomatoes and broccoli, but that of bananas increased. In 5 nonclimacteric fruits (3 citrus sp., grapes and Japanese pears) and several vegetables (carrots, onions, cauliflower and cabbage), in which C_2H_4 production was not detected, high CO_2 affected respiration little, if at all. When eggplants, cucumbers, podded peas, spinach and lettuce were treated with high CO_2, C_2H_4 production began and respiration increased. The results indicate that the respirtory responses of harvested horticultural corps to high CO_2 might be mediated by the effects of CO_2 on the action and/or synthesis of C_2H_4. AS

Taro

980

Nip (WK) and Wei (PS). **Preliminary study on the grouping of taro (*Colocasia esculenta* (L.) Schoot) by isoelectric focusing.** *Food Chemistry* 41(2): 1991: 117-122

Based on the distribution of prolamin and albumin bands and uniqueness of some of the bands, nine taro cvs from American Samoa and Hawaii were categorised into group I consisting of Niu'e, Manu'a and Lehua, group II Matagi Fanua, Pula Sama, Samoa, Apii and an yellow cv and group III Palagi. SD

Potatoes

981

Sandhu (KS) and Bhupinder Kaur. **Effect of storage and pre-treatments on potato chip colour quality.** *Journal of Food Science and Technology (India)* 29(2): 1992: 113-114

A study was conducted, on potato var., 'K. Jyoti', 'K. Badshah' and 'K. Chandramukhi' to investigate the effect of storage temp. and various pre-treatments of potato slices on the chip colour quality. The var. were stored at 5 plus or minus 2 C, 11 plus or minus 2 C and 23.5 - 37 C (ambient conditions). Initial analysis showed that 'K. Jyoti' var. was best for chip colour. During storage under ambient conditions 'K. Chandramukhi' retained very good colour quality of fried chips upto 10 wks while other var. were

assessed lower in colour quality. None of these var. were found suitable for chips after storage at 5 plus or minus 2 C and 11 plus or minus 2 C due to poor colour quality even after reconditioning at 20 C for one month. Among the various pre-treatments given to slices of stored potato, blanching in water at 80 C for 1 min was found to be optimum and was very effective in improving the colour of chips while the chips obtained after treating the slices with absolute ethanol for 5 min followed by dipping 0.2% potassium metabisulphite solution for 5 min was best among the chemical pre-treatments and assessed next in colour to that obtained after blanching. AS

982

Jadhav (SJ), Mazza (G) and Salunkhe (DK). **Terpenoid phytoalexins in potatoes. A review.** *Food Chemistry* 41(2): 1991: 195-217

Chemistry, extraction, separation and assay, biosynthesis and metabolism of terpenoid phytoalexins in potatoes are summarized. The molecular structures and physico-chemical properties of major and minor terpenoid phytoalexins of potatoes are presented and their characterization and function are discussed. 64 references. SD

Sweet potatoes

983

Dawkins (NL) and Lu (JY). **Physico-chemical properties and acceptability of flour prepared from microwave blanched sweet potatoes.** *Journal of Food Processing Preservation* 15(2): 1991: 115-124

Flours from microwave blanched/steam blanched/unblanched 'Jewel' sweet potatoes showed significant differences ($P < 0.05$) in moisture, ash, starch, sugar and thiamin but no difference in L-values. Microwave/steam blanched flours, being comparable in oil and water-holding capacity/viscosity were deeper in yellow-orange colour than the unblanched one. Microwave blanched flour with 18% high yield showed significantly smaller a-values and greater b-values for unblanched flour and gave better quality bread, cake and cookies. SD

Vegetables

984

Karovicova (J), Polpnsky (J), Drdak (M) and Pribela (A). **Determination of nitrates in vegetables by capillary isotachophoresis.** *Die Nahrung* 34(8): 1990: 765-767

The present paper deals with the detn. of nitrates by capillary isotachophoresis. The detn. was tested on vegetable samples bought in the shop and the market hall. High nitrates concn. in vegetable is mainly due to the excessive nitrogen content in the soil system, thus deteriorating the nutritional and hygienic values of products and complicating the processing and storage. Hence increased attention is paid to nitrates not only by medical staffs, especially by hygienists, but also by farmers, nutritionists and, to a certain degree, also by consumers. At present, various analytical methods are used to determine nitrates in biological material, such as the spectrophotographic and potentiometric methods. Nitrates may also be estimated by polarography, AAS, GC, HPLC and capillary isotachophoresis (ITP). AS

Tomatoes

985

Marangoni (AG) and Stanley (DW). **Studies on the long-term storage of mature, green tomato fruit.** *Journal of Horticultural Science* 66(1): 1991: 81-84

Greenhouse-grown mature-green tomato fruit (*Lycopersicon esculentum* cv. Caruso) were stored under air or modified atm. (MA-3% O_2 plus 2% CO_2) at 6 and 12 C followed by ripening for 7 days at 22 C. Treatments with aqueous solutions of Ca, EDTA, EGTA, BHT, α-tocopherol and paclobutrazol were applied as dips to assess their ability to prevent chilling injury (CI) or retard senescence. Chemical treatments were not beneficial to the quality attributes of the fruit relative to the control, and MA storage did not alleviate CI symptoms relative to the air stored samples. Greenhouse-grown fruit could be stored for at least 30 days in the mature-green state at 12 C under MA with no detectable changes in quality for samples kept at 6 C showed marked deterioration after 15 days of storage under both air and MA. Samples stored at 12 C under an air atm. for 30 days ripened completely. Field-grown mature green tomato fruit (*Lycopersicon esculentum* cv. Heinz 91-29) stored at 12 C under MA could only be stored between 10 and 30 days due to heavy fungal infection. AS

986

Frank (R), Braun (HE), Ripley (BD) and Pitblado (R). **Residues of nine insecticides and two fungicides in raw and processed tomatoes.** *Journal of Food Protection* 54(1): 1991: 41-46

The objective of this study was to determine preharvest intervals for nine insecticides (acephate, azinphosmethyl, carbaryl, demeton, diazinon, dimethoate, endosulphan, malathion and

permethrin) and two fungicides (captafol and chlorothalonil) in order to produce raw tomato fruit and juice with residue levels below 0.1 and 0.01 mg kg^{-1}, respectively. Over a 4 yr period (1985-88) ripe tomato fruit was commercially treated with these 11 pesticides and harvested on days 0, 1, 3 and 6, 7 or 8 after spraying. Residues of the 11 pesticides fell below 0.1 mg kg^{-1} in juice and eight declined below 0.1 mg kg^{-1} on raw fruit during the 0 to 8 day harvest period. Many of the pesticides required a longer preharvest interval than 6 - 8 days to attain a reduction in residue to 0.01 mg kg^{-1}. Tomato products including chili, catoup, juice, paste and sauce were analysed for a wide range of pesticides and no detectable residues were found. BV

FRUITS

987

Jayaraman (KS) and Raju (PS). **Development and evaluation of a permanganate-based ethylene scrubber for extending the shelf-life of fresh fruits and vegetables.** *Journal of Food Science and Technology (India)* 29(2): 1992: 77-83

A shelf-stable and cost-effective granulated ethylene scrubber based on potassium impregnated in an inert matrix formulated using alumina and limestone was developed and evaluated against scrubber matrices like cement and silica-gel *vis-a-vis* an imported trade scrubber (U.K.). The Al_2O_3-limestone and cement based formulations showed satisfactory overall ethylene absorption, granule firmness and shelf-stability comparable to the trade product. Among the two absorbents, the alumina based formulation performed better than the cement based. Laboratory and large scale (on board ships) storage trials with mango, tomato, brinjal and okra at ambient temp. and/or 10 C and banana under ambient temp. only using the scrubber sachets/blankets showed an overall extension in shelf-life ranging from 3 - 8 days which is comparable to trade scrubber. The technique for production and packaging of the absorbent granules is simple, inexpensive and easy to adopt by small scale industry. The alumina and cement based scrubbers cost approx. Re. 0.18 and 0.06 respectively per kg fruit/vegetable to be stored as compared to Rs. 2.00 for the imported trade product. AS

988

Stoker (F). **Mixing, homogenization, deaeration of fruit and vegetable pulps.** *Fluessiges Obst* 56(9): 1989: 530-536 (De)

Apples

989

Roudot (AC), Duprat (F) and Pietri (E). **Simulation of a penetrometer test on apples using Voronoi-delaunay tessellation.** *Food Microstructure* 9(3): 1990: 215-222

Apple tissue was simulated based on computer graphics for penetrometric tests on apples. The study showed that irregular shape of the curve is due to the evacuation of collapsed cells just before the plunger whose shape has almost no influence on the result whereas the cell stiffness is the most influential one. Using penetrometer two measurements are obtained-firmness (mean value of the curve after skin peak) and its variation with depth (the slope of the curve). SD

Guava

990

Dutta (P), Banik (AK), Raychaudhury (R) and Dhua (RS). **Influence of ethylene absorbents on shelf-life of guava fruits.** *Indian Journal of Horticulture* 48(3): 1991: 213-216

The relative effectiveness of celite-$KMnO_4$ and silica-gel $KMnO_4$ mixture as ethylene absorbents in the storage of non-climacteric fruit, guava in sealed polyethylene bags has been studied. Mature green guava fruits cv. L-49 was harvested just prior to colour break stage with uniform sp. gr., and packed in 200 guage LDPE bags containing celite-$KMnO_4$, silica-gel-$KMnO_4$ separately. Fruits in polyethylene bag without any ethylene absorbents was also maintained in order to study the effects of ethylene absorbent. Bags were stored at ambient temp. (29 - 32 C) and RH 82 - 85%. Fruit quality was assessed at 3-day intervals upto 15 days. The total soluble solids content, sugar, titrable acidity,and ascorbic acid contents were estimated. Celite-$KMnO_4$ mixture as ethylene absorbent was more promising as compared to silica-gel-$KMnO_4$ mixture for the storage of guava. The storage of fruits in LDPE bags celite-$KMnO_4$ mixture showed min. wt. loss, slower ripening during storage, and the fruit quality was good. SRA

Kiwifruits

991

Vial (C), Guilbert (S) and Cuq (JL). **Osmotic dehydration of kiwifruits: Influence of process variable on the colour and ascorbic acid content.** *Sciences Des Aliments* 11(1): 1991: 63-84

Mangoes

992
Vijay Sethi and Maini (SB). **Studies on storage of mango pulp.** *Indian Journal of Horticulture* 48(3): 1991: 228-231

PVC bottles, HDPE pouches (150 guage) and glass bottles were used for preserving mango pulp with and without the addition of chemical preservatives. In bottles mango pulp was mixed with 1000 p.p.m. of SO_2 alone and 500 p.p.m. of SO_2 and 500 p.p.m. of sodium benzoate and stored at 25 - 35 C and 1 - 3 C for 1 yr and the changes in chemical composition and overall quality was determined. Mango pulp was also packed in PVC bottles and HDPE pouches and 500 p.p.m. SO_2 alone or 500 p.p.m. of SO_2 and 250 p.p.m. each of SO_2 and sodium benzoate were added and stored for 4 months at 25 - 35 C. Mango pulp was also stored for 3 months in HMHD film pouches (200 guage) after adding SO_2 (50 and 75 p.p.m.) at 0 C, 24 - 28 C and 40 C. Glass bottles were found more suitable than PVC, HDPE, HMHD film for mango pulp storage. The pulp was acceptable sensorily upto 1 yr in glass bottles, 7 - 8 months in PVC bottles, 2 months in HDPE and 45 days in HMHD pouches. Addition of sodium benzoate to SO_2 was helpful in the retention of colour, but in its presence, there was slight increase in non-enzymatic browning and decrease in carotenoid pigments. Additions of SO_2 alone and storage in low temp. helped in the retention of carotenoids and flavour. SRA

Papayas

993
An (J-F) and Paull (RE). **Storage temperature and ethylene influence on ripening of papaya fruit.** *Journal of the American Society for Horticultural Science* 115(6): 1990: 949-953

Strawberry

994
Issanchou (SN), Maingonnat (JF), Guichard (EA) and Etievant (PX). **Oral consistency and simple rheological measurement of strawberry jams.** *Sciences Des Aliments* 11(1): 1991: 85-98

CONFECTIONERY, STARCH AND SUGAR

995
Gupta (JK), Rajesh Kaushik and Joshi (VK). **Influence of different treatments, storage temperature and period on some physico-chemical characteristics and sensory qualities of Indian honey.** *Journal of Food Science and Technology (India)* 29(2): 1992: 84-87

Colour darkening of honey was significantly affected by the storage temp. and period. Storage of honey at 40 C resulted in deterioration of colour, increase in colloidal contents and complete inhibition of granulation. Addition of potassium metabisulphite reduced the darkening effect of honey at room temp., but did not affect the samples at 5 C. Heat treatment also reduced the darkening of honey and prevented granulation both at room temp. and 5 C for 60 and 90 days, respectively. The various treatments and storage period employed affected the sensory qualities of honey to a variable extent. Honey stored at 40 C was not liked due to perceivable after taste. In sensory qualities, unheated honey stored at 5 C was found to be the best. AS

996
Penichter (KA) and McGinley (EJ). **Cellulose gel for fat-free food applications.** *Food Technology* 45(6): 1991: 105

Advantages of cellulose gel used as additives to supplement food formulations to replace the functional, textural and flavour properties of fat are discussed. Different types of cellulose gel, such as the RC and CL types of Avicel cellulose gel, RCN-30, RCN-15 and RCN-10, their functionality and composition are also dealt. CSA

997
Ang (JF) and Miller (WB). **Multiple functions of powdered cellulose as a food ingredient.** *Cereal Foods World* 36(7): 1991: 558-559, 561-564

The use of certain fibers such as powdered cellulose at lower levels help to improve the quality of many products. Aspects covered in this article include: distinctive properties of powdered cellulose, improving cake vol., improving cake texture, fat reduction in fried foods (testing batters with cellulose and cake-type doughnuts) and water retention capacity and viscosity. BV

998
Oderinde (RA), Esuoso (KO) and Adesogan (EK). **The effects of lipids on the alcoholic fermentation of molasses using *Saccharomyces cerevisiae*.** *Die Nahrung* 34(8): 1990: 681-688

Confectionery

Chocolate

999

Koyano (T), Hachiya (I) and Sato (K). **Fat polymorphism and crystal seeding effects on fat bloom stability of dark chocolate.** *Food Microstructure* 9(3): 1990: 231-240

Reviewing the effects of seeding with fine crystal powders on physical properties of dark chocolates in terms of polymerism and crystallization behaviour of cocoa butter and of its major fat constituents, this paper gives details on replacement of tempering method in chocolate solidification process by a simple cooling technique using fat seed crystals. Although all powders accelerated crystallization and improved fat bloom stability except tristearoylglycerol, it is concluded that β_2 form of 1,3-dibehenoyl-2-oleyl-glycerol performs best. SD

1000

Precht (D). **Quantitative detection of milk fat in chocolate mixtures. I. Determination of milk fat in cocoa butter.** *FAT Science Technology* 92(4): 1990: 153-161 (De)

New methods for the quantitative detn. of milk fat proportions in cooca butter samples based on GC analysis of fatty acids and triglycerides are described. 45 different cocoa butter types from 25 countries and 755 milk fat samples were analyzed by taking different feeding conditions into account. By means of triglyceride measurements mean relative deviations of approx. 5% from the 2 - 10% milk fat additions were established for known cocoa butter- and unknown milk fat composition. With completely unknown initial fats a mean relative deviation of approx. 6% was measured using fatty acid analysis. AS

1001

Precht (D). **Quantitative detection of milk fat in chocolate mixtures. II. Determination of milk fat in chocolate.** *FAT Science Technology* 92(7): 1990: 275-281 (De)

Using GC fatty acid analysis proportions of 4 - 12% milk fat additions varying in composition were quantitatively detected in different chocolate fats. Independent of the type of chocolate best recovery with mean absoulte deviation of 0.64 and 0.68% was obtained using the fatty acid C4 and the combination C4-C6. Compared to milk chocolate most precise detection was achieved for milk fat additions to bitter chocolate. Here differences of 0.39%, on av., were observed between experimentally added and theoretically computed proportions. Unlike hazelnut or almond oil, coconut or palm kernel oil present in chocolate fats can hamper the measurements. Capillary column GC of the triglycerides allows sensitive indications of the presence of such vegetable fats in a chocolate mixture to be obtained. AS

Starch

1002

Chinachoti (P), White (VA), Lo (L) and Stengle (TR). **Application of high-resolution carbon-13, oxygen-17, and sodium-23 nuclear magnetic resonance to study the influences of water, sucrose and sodium chloride on starch gelatinization.** *Cereal Chemistry* 68(3): 1991: 238-244

Sugar

Gur

1003

Sudama Singh, Umrao Lal and Sharma (RK). **Temperature in relation to juice concentration in gur preparation.** *Indian Sugar* 41(9): 1991: 665-667

Experiment was aimed to find the optimum temp. at different stages of juice concn. for quality gur manufacture. At 48.6 C temp. the first scum started to accumulate on the surface of the conc. juice. The scum fully appeared on the surface at 85 C. The Deola water was added at 78.8 C and the hissing which started at 55 C was stopped at 78.8 C. The second scum formed was removed at 93.8 C. The boiling of the juice started at 97.8 C; the Chandoi was removed at 98.8 C from the conc. juice fog formation was at 100 C, froathing at 101.2 C and bubble formating at 107.6 C. Fuelling was stopped when the conc. juice reached 109 C. At 118 C the conc. mass was transferred into chak for cooling. In chak first light stirring was done at 106 C with second brisk stirring at 100 C and when the temp. came down to 87 C the mass was transferred to gur moulds. The fuel consumption at different stages of concn. has been tabulated in kg and in % over juice. SRA

Sugar cane

1004

Pavitrakar (NR), Bonde (RS) and Kalmegh (VB). **Clarification characteristics of cane varieties: C0-7219 and CoC-671 grown in Vidarbha region of Maharastra State.** *Indian Sugar* 41(8): 1991: 621-622

Juice from cane var. Co-7219, and CoC-671 was clarified by hot liming defection process and heated to 80 C. Milk of lime at 10 °Be was added to maintain 6.9 to 7.2 pH, heated to b.p. and allowed to settle the mud. Mud vol. was measured. After complete settling, clear juice was decanted and analysed for sp. gr., coeff. of purity, pH and compared with untreated control juice. The settled mud vol. was 34.9% in Co-7219 and 37.9% in CoC-671 and it was double in control. The rate of settling was 4.33 to 0.03 for Co-7219 and 4.15 to 0.027 cm/min for CoC-671. The coeff. of purity was 87.94 in Co-7219 and 85.98 in CoC-671. Sp. gr. of clarified juice declined in test var. accompanied with rise in purity. SRA

1005

Taneja (AD) and Punia (MS). **Effect of freeze temperature on quality indicators of cane juice.** *Indian Sugar* 41(8): 1991: 623-625

Seven sugarcane cv. (Co-6974, Co-7314, Co-7717, CoJ-64, Co-1158, Co-1148 and CoJ-58) were exposed to -4 C for 12 h and milled after 0, 2, 5 and 8 days of deep freeze exposure. Commercial cane sugar % (CCS %) decreased in all freeze exposed cv. except in Co-1148 and Co-7314; max. CCS % decrease was in Co-6974. Gum content increased max. in Co-6974 followed by C0J-58, least 'gum content was in Co-1148 and Co-7314 at the same interval after the freeze-treatment. Titratable acidity increased significantly in the post-freeze period: the increase was correlated with the time lapsed after freeze exposure. Titratable acidity was min. in Co-1148, Co-7314 and Co-7717 as compared to other test var. The juice of Co-6974 registered highest increase in titratable acidity 8 days after the freeze treatment. The freeze treatment lowered the pH of juice in all var. Freeze exposure increased reducing sugar content in the post frozen period. The rate of inversion was low in the beginning after freeze treatment but later increased rapidly. It is concluded that Co-1148 and Co-7314 showed min. increase in titratable acidity, gum content and reducing sugars (%) and a lower fall in CCS % and pH in its juice than other var. SRA

BAKERY PRODUCTS

1006

Zwingelberg (H) and Brummer (J-M). **Baking machines in a mill laboratory.** *Getreide-Mehl und Brot* 44(5): 1990: 142-147 (De)

1007

Rocken (W), Haffke (H) and Kramer (H-D). **Problems with carrier material for fermenting doughs.** *Getreide-Mehl und Brot* 45(7): 1991: 203-206 (De)

1008

Seibel (W) and Brummer (JM). **Dietary fibers and the baking properties.** *Getreide-Mehl und Brot* 45(7): 1991: 212-216 (De)

1009

Lu (H) and Brummer (J-M). **Optimisation of evaluation and quality of Chinese steamed rolls.** *Getreide-Mehl und Brot* 45(7): 1991: 220-222 (De)

Bread

1010

Rasco (BA), Borhan (M), Yegge (JM), Lee (MH), Siffring (K), Bruinsma (B). **Evaluation of enzyme and chemically treated wheat bran ingredients in yeast-raised breads.** *Cereal Chemistry* 68(3): 1991: 295-299

The present study reports the chemical (acid, base, ethanol) or enzymatic (amylase, protease) modification of wheat bran to enhance the functional properties of bran in addition to increasing the total dietary fiber content of the foods to which the bran is added. Ingredients with the highest neutral detergent fiber content were produced using an α-amylase treatment or a combination of α-amylase and protease treatments. Protease treatment yielded ingredients with relatively poor baking properties. The breads containing bran treated with either α-amylase or α-amylase/calcium oxide had the best crumb grain score of the experimental fiber ingredients evaluated. BV

1011

Ludewig (H-G) and Seibel (W). **Optimization of recipes and shelf-life of *Oblaten*-gingerbread.** *Getreide-Mehl und Brot* 44(5): 1990: 151-157 (De)

1012

Mettler (E), Seibel (W), Elbaya (AW) and Pfeilsticker (K). **Experimental studies on the effects of emulsifiers and gums in order to optimize the quality of wheat bread. Part 2. Analytical and rheological studies on the effects of emulsifiers and gums in .dough phase.** *Getreide-Mehl und Brot* 45(7): 1991: 206-210 (De)

1013

Wahrburg (U) and Martin (H). **Use of bread and rolls in a cholesterol-lowering diet. Part 2. Results of**

the controlled dietary study. *Getreide-Mehl und Brot* 45(7): 1991: 210-212 (De)

Dough

1014

Michniewicz (J), Biliaderis (CG) and Bushuk (W). **Effect of added pentosans on some physical and technological characteristics of dough and gluten.** *Cereal Chemistry* 68(3): 1991: 252-258

The effect of added water-soluble and water-insoluble pentosans of wheat (WS-W and WI-W, resp.) and water-soluble pentosans of rye (WS-R) on farinograph properties of wheat doughs, on the yield of wet and dry gluten, and on the solubility of doughs and glutens in acetic acid (HAc) and acetic acid-urea (AU) solvents was investigated. Additionally, the HAc and AU fractions were examined by gel-filtration chromatography and sodium dodecyl sulphate-polyacrylamide gel electrophoresis. All three pentosan preparations had a marked effect on farinograph properties; water absorption and dough development time increased. On an equal wt. basis, the WS-R pentosans produced the largest changes in these parameters. The effect of pentosans on gluten yield varied according to the characteristics of the base flour and the type and amount of pentosans added. In general, the yield of wet gluten decreased, particluarly at the lower of the two levels (1 and 2%) of pentosan supplementation. Added WI-W and WS-R had a significant effect on the extractability of proteins from the dough and gluten of Katepwa (Canada western red spring wheat var.) with HAc and AU solvents. Adding pentosans decreased the amount of protein soluble in HAc and increased the amount in AU extracts for the dough samples; opposite trends were observed for the gluten. The results of gel filtration and electrophoresis show that WS-W and WI-W pentosans affect the aggregation-disaggregation processes of the high mol. wt. proteins and produce minor changes in the electrophoretic patterns of the HAc- and AU-soluble proteins. AS

Pasta

1015

Granfeldt (Y) and Bjorck (I). **Glycemic response to starch in pasta: A study of mechanisms of limited enzyme availability.** *Journal of Cereal Science* 14(1): 1991: 47-61

The aim of this work was to measure the availability of starch in pasta products and to study the mechanisms which affect the rate of digestion and absorption of starch in pasta. Healthy subjects were given test meals with an equivalent amount of available carbohydrate from macaroni (25/75% durum/Swedish wheat flour), spaghetti (100% durum wheat flour + monoglycerides), 'spaghetti porridge' (cooked spaghetti mixed in a food processor) and, for comparison, bread (made from spaghetti ingredients) or mashed potatoes. Blood glucose levels were measured over a 3 h period and glycemic indices (GI) were calculated using 90 and 120 min areas under the glucose curves. A new *in vitro* test was introduced to measure the rate of starch hydrolysis in products with a food form 'as eaten'. The three pasta products produced significantly lower peak blood glucose values and lower GI (90 min) than the corresponding bread. The spaghetti also displayed a more favourable late post-prandial glucose response, with a low but sustained increment above the fasting level in the late phase. Significant differences between bread and mashed potatoes were only detected in the late phase. The 'lente' properties of the pasta were assigned to a restricted enzymic availability due to a more compact food texture. The importance of the food structure was further substantiated by a significant increase in GI following mixing of the spaghetti product. The *in vitro* method ranked the different wheat products similarly to the *in vivo* situation and is recommended for prediction of the glycemic response to various food items. AS

1016

Didone (G) and Pollini (CM). **Controlling of Maillard-reaction during THT drying of pasta.** *Getreide-Mehl und Brot* 45(7): 1991: 216-219 (De)

MILK AND DAIRY PRODUCTS

1017

Brooker (BE). **The adsorption of crystalline fat to the air-water interface of whipped cream.** *Food Microstructure* 9(3): 1990: 223-229

In normal whipped creams fat crystals were sparse, penetrated some of the bubbles and found in the plane of air-water interface whereas in the defective ones large numbers of needle-like crystals penetrated air-water interface of every bubble adsorbing reduced numbers of fat globules. Morphological evidence revealed that the crystals reached interface before the fat globules and that the needle-like crystals were dislodged by shear forces during whipping and adsorbed to bubbles. Possible mechanisms for low overrun and long whipping times in defective creams are discussed. SD

1018

Jaswant Singh. **Control of adulteration in milk with a simple device.** *Indian Dairyman* 44(1): 1992: 15-17

A simple metallic device based on the lectometer principle has been developed, which can be directly put in the vessel of the milk. This will give an on the spot indication of the extent of adulteration of milk which will be depicted on the graduated scale. The sketch of the adulteration tester is given. SRA

1019

Sharma (DK) and Joshi (DV). **Bacteriological quality of milk and milk products with special reference to *Salmonella* and its public health significance.** *Journal of Food Science and Technology (India)* 29(2): 1992: 105-107

Out of the 267 samples of milk and milk products examined, *Salmonella* spp. could be isolated from 5 samples of milk products. Among these, *S. weltevreden* and *S. enteritidis* could be isolated from the two samples each whereas *S. typhimurium* was isolated from one sample. Various other microorganisms isolated from these samples were *E. coli*, *Klebsiella* spp., *Pseudomonas* spp., *Alkaligenes faecalis* and *Proteus* spp. The public health importance of these findings is reviewed. 11 references. AS

1020

Attia (H), Bennasar (M) and Fuente (BTDL). **Study of the fouling of inorganic membranes by acidified milks using scanning electron microscopy and electrophoresis. I. Membrane with pore diameter 0.2 μm.** *Journal of Dairy Research* 58(1): 1991: 39-50

1021

Attia (H), Bennasar (M) and Fuente (BTDL). **Study of the fouling of inorganic membranes by acidified milks using scanning electron microscopy and electrophoresis. II. Membrane with pore diameter 0.8 μm.** *Journal of Dairy Research* 58(1): 1991: 51-65

1022

Augustin (M-A) and Clarke (PT). **Heat stability of recombined concentrated milk: Changes in calcium activity and pH on sterilization.** *Journal of Dairy Research* 58(1): 1991: 67-74

Recombined concentrated milks (18% SNF, 8% fat) at their natural pH and at pH values in the range 6.28 - 6.68, made with powders subjected to different preheat conditions (high heat (85 C, 30 min), indirect UHT (120 C, 2 min) and direct UHT (120 C, 2 min)), were sterilized at 120 C for 13 min. The heat stabilities of recombined concentrated milks were dependent on preheat treatment. Ca^{2+} activity and pH of sterilized recombined concentrated milks, measured 1 h after sterilization, were lower than those of corresponding unsterilized recombined concentrated milks. The magnitude of the decreases in Ca^{2+} activity and pH induced on sterilization were dependent on the pH of the unsterilized recombined concentrated milk but were not markedly influenced by the type of preheat treatment applied during powder manufacture. The results suggest that differences in heat stability of high heat, indirect UHT and direct UHT powders are unlikely to be due to Ca^{2+} activity. AS

1023

Banon (S) and Hardy (J). **Study of acid milk coagulation by an optical method using light reflection.** *Journal of Dairy Research* 58(1): 1991: 75-84

A turbidimetric method, based on light reflection, was used to study acid coagulation of reconsituted skim milk at low temp. Capillary viscosimetry, gelograph and laser granulometer techniques were also employed. Acidification of milk was produced by hydrolysis of glucono-δ-lactone. The general shape of the turbidimetric signal as a function of pH or time can be divided into three stages: a lag phase followed by a significant decrease and then a final rise. Two factors have a great influence on the development of milk turbidity, pH and temp. Dynamic viscosity measurements can be related to the turbidimetric signal while laser granulometric measurements cannot be correlated with changes in turbidity: the micelle size distribution remains constant until the first signs of gelation. As previous work showed, dynamic viscosity diminishes with acidification until a particular pH is reached (pH 5.9 at 15 C and pH 5.75 at 20 C). The latter period is related to the turbidimetric lag phase. As milk turbidity became lower than its initial value (pH 5.75 at 15 C and pH 5.55 at 20 C), dynamic viscosity increased significantly. The release of material from micelles (β-casein and Ca) could explain this phenomenon. In the same way, further increase of turbidity at a particluar pH value (pH 5.3 at both 15 and 20 C) could be partly due to the reincorporation of soluble casein monomers in the micelle framework. As the onset of gelation was approached, turbidity still increased as a result of gel network formation. AS

1024

Singh (H) and Creamer (LK). **Influence of concentration of milk solids on the dissociation of micellar k-casein on heating reconstituted milk at 120 C.** *Journal of Dairy Research* 58(1): 1991; 99-105

Skim milks were prepared from skim milk powder at several concn. between 10 and 25% total solids and portions were pH-adjusted to between pH 6.3 and 7.1 and heated at 120 C. After ultracentrifugation (88000 g for 90 min), the supernatants were analysed using gel electrophoresis to determine the concn. of β-lactoglobulin, α-lactalbumin and k-casein. The dissociation of k-casein from the micelles was dependent on both the pH and the total solids content of milk before heating. Both higher pH (in the range 6.5 - 7.1) and higher concn. increased the extent of dissociation. A further series of samples were heated for 2 - 11 min at 120 C at pH 6.55. K-casein dissociation increased with concn. and with heating time. It was concluded that as the milk increased in concn., the pH at which micellar k-casein dissociated on heating was lowered. AS

1025

Doco (T), Carcano (D), Ramos (P), Loones (A) and Fournet (B). **Rapid isolation and estimation of polysaccharide from fermented skim milk with *Streptococcus salivarius* subsp. *thermophilus* by coupled anion exchange and gel-permeation high-performance liquid chr.omatography.** *Journal of Dairy Research* 58(1): 1991; 147-150

1026

Bradshaw (JG), Peeler (JT) and Twedt (RM). **Thermal resistance of *Listeria* spp. in milk.** *Journal of Food Protection* 54(1): 1991: 12-14

The thermal resistance of one strain each of *Listeria ivanovii*, *L. seeligeri*, and *L. welshimeri* and three *L. monocytogenes* strains was determined in raw and sterile milk. *Listeria* spp. suspended in milk at concn. of 1 x 10^5 cells/ml were heated at temp. ranging from 52.2 to 71.1 C for various contact times. The heat resistance of *L. monocytogenes* appeared somewhat greater than that of the other *Listeria* spp. in both milks, but the difference was not statistically significant (α = 0.05). High-temp., short-time processing is adequate for pasteurization of raw milk. AS

Milk products

1027

Salminen (S), Gorbach (S) and Salminen (K). **Fermented whey drink and yoghurt-type product manufactured using *Lactobacillus* strain.** *Food Technology* 45(6): 1991; 112

Gefilus fruit-flavoured whey drink and yoghurt-type product is fermented with *Lactobacillus* GG to produce a satisfying product especially suitable for consumers who do not like traditional fermented dairy products. Balancing of the intestinal function, controlling of both diarrhea and constipation are some of the various health benefits offered by the consumption of *Lactobacillus* GG fermented dairy products. CSA

Cheese

1028

Upadhyay (KG). **Pretreatment of milk for cheese manufacture and their significance.** *Indian Dairyman* 44(1): 1992; 26-40

The technological aspects of various pretreatments involved and their significance in cheese making are described. These include chilling and cold storage, lactoperoxidase/thiocyanate/H_2O_2 treatment, thermization, centrifugation, standardization, pasteurization, homogenization, lactose hydrolysis and concn. Each step has been described elaborately. SRA

1029

Groupe de Travail Cnerna "Flore Pathogene des Fromages". **Recommendations for identification of sources of coliform contamination in soft cheeses made from pasteurised milk.** *Sciences Des Aliments* 11(1): 1991: 171-183 (Fr)

Goat cheese

1030

Requena (T), Pelaez (C) and Desmazeaud (MJ). **Characterization of lactococci and lactobacilli isolated from semihard goats' cheese.** *Journal of Dairy Research* 58(1): 1991; 137-145

Several strains of *Lactococcus lactis* subsp. *lactis*, *Lactobacillus casei* and *Lb. plantarum* isolated from traditional goats' cheese have been studied for titratable acidity, proteolysis in milk and enzymic activities. Aminopeptidase activities were measured with whole cells and cells permeabilized with Triton X-100. Caseinolytic activity was investigated using electrophoresis in polyacrylamide gel with sodium dodecyl sulphate. *Lc. lactis* subsp. *lactis* had a level of proteolytic activity in skim milk greater than that of *Lb. casei*, while this activity in *Lb. plantarum* was very low. Alanine aminopeptidase activity was almost non-existent for all strains tested, while lysine aminopeptidase activity appeared to be of

fundamentally intracellular origin. Leucine aminopeptidase activity was also greater in cells that had been permeabilized than in whole cells for *Lb. casei* and *Lb. plantarum*. Lc. lactis subsp. *lactis* lecuine aminopeptidase activity was greater in whole cells. No significant hydrolysis of casein was found with *Lb. casei* IFPL 725 and *Lb. plantarum* IFPL 722 permeabilized with Triton X-100 after 24 h incubation with whole bovine casein. AS

Mozzarella cheese

1031

Ghosh (BC) and Singh (S). **Quality of mozzarella cheese produced by using different milk clotting enzymes.** *Journal of Food Science and Technology (India)* 29(2): 1992: 115-116

Mozzarella cheese was prepared from buffalo milk standardized to 4% fat using microbial Meito and Modilase rennets and calf rennet as control. Modilase produced better quality cheese than Meito rennet. Good quality Mozzarella cheese could be prepared by microbial rennet. Body and texture of the cheese made by using modilase rennet were similar to teh cheese made by using calf rennet. Fat and total solids recovery was more in the cheese made by using calf rennet whereas yield and melting were better in the cheese prepared by microbial rennet. Stretching was best in the cheese made by using calf rennet. AS

Khoa

1032

Christie (IS) and Shah (US). **Development of a three stage continuous khoa making machine.** *Indian Dairyman* 44(1): 1992: 1-4

The salient constructional and other features of a three stage khoa making machine has been outlined and diagramatically represented. The first stage raises the milk solids level from 15 to 25%, the second stage from 25 to 50% and the third stage from 50 to 70%. The capacity is 50 kg of milk/h. Sensorily, the khoa and the flavour was slightly better than that prepared in a stainless steel kettle. SRA

Paneer

1033

Syed (HM), Rathi (SD) and Jadhav (SA). **Studies on quality of *paneer*.** *Journal of Food Science and Technology (India)* 29(2): 1992: 117-118

Yield (18.24%) and total milk solids (53.16%) recovered were found to be highest in *paneer* prepared from buffalo milk. Buffalo milk *paneer* was graded as "Excellent" and scored highest (93.33) for its overall sensory qualities. In the case of skim milk paneer, moisture, protein and ash were found to be max. The values obtained for hardness, gumminess and chewiness in case of skim milk paneer were highest while lowest values were obtained for cohesiveness and springiness. The highest and significant correlation coeff. of 0.85 was between springiness and fat whereas the lowest and non-significant correlation coeff. of 0.11 was between cohesiveness and fat. AS

1034

Babje (JS), Rathi (SD), Ingle (UM) and Syed (HM). **Effect of blending soy milk with buffalo milk on qualities of *paneer*.** *Journal of Food Science and Technology (India)* 29(2): 1992: 119-120

The possibility of blending soy milk with buffalo milk for obtaining good quality *paneer* has been examined. Soaking soy dhal in sodium bicarbonate was preferred by consumer panel over other treatments. Addition of soy milk to buffalo milk up to 20% had no adverse effect on quality of *paneer* and resembled that of milk *paneer* in taste, colour and springiness. However, the *paneer* prepared by blending soy milk showed higher protein content. AS

Shrikhand

1035

Boghra (VR) and Mathur (ON). **Chemical quality of some marketed indigenous milk products: Major constituents and mineral composition of *shrikhand*.** *Journal of Food Science and Technology (India)* 29(2): 1992: 121-122

Shrikhand (a fermented milk product) collected from five shops of Anand (Gujarat) showed wide variations in total solids, fat, protein, carbohydrates, ash and pH values. The fat varied from 2.0 to 5.0%. All the samples, except one under organised dairy undertaking, did not conform to the min. limit of 8.5% as prescribed by Bureau of Indian Standards. Wide variations were also observed for different minerals in *Shrikhand* from various shops. The market samples also showed wide variations in citrate, Cu and Fe levels. AS

MEAT AND POULTRY

Meat

1036

Huhtanen (CN). **Inhibition of *Clostridium botulinum* toxin formation by *C. sporogenes* in culture media and in a meat system.** *Journal of Food Protection* 54(1): 1991: 50-52

Beef

1037

Egbert (WR), Huffman (DL), Chen (C) and Dylewski (DP). **Development of low-fat ground beef.** *Food Technology* 45(6): 1991: 64, 66-68, 70-71, 73

1038

Gudaszewski (T) and Lesiow (T). **Influence of proteolytic and lipolytic enzymatic preparations on rheological properties of beef.** *Die Nahrung* 34(8): 1990: 671-679

Products

1039

Shahidi (H) and Hong (C). **Evaluation of malonaldehyde as a marker of oxidative rancidity in meat products.** *Journal of Food Biochemistry* 15(2): 1991: 97-105

Poultry

1040

Kesava Rao (V), Ravindra Sharma and Kowale (BN). **Effect of chilling on poultry meat.** *Poultry Guide* 29(1): 1992: 51-54

Poultry meat is chilled for reducing the mirobial growth rate; improving the product appearance; for getting higher overall product quality; and for prevention of off-flavours. Dry chilling, immersion chilling, stationary vat chilling, drag through units, portable tank chilling, continuous ice slush and water filtration systems and heat exchangers are the chilling methods usually employed. Advantages and disadvantages of these chilling methods are enumerated. GS

1041

Giddings (GG) and Marcotte (M). **Poultry irradiation: For hygiene/safety and market-life enhancement.** *Food Reviews International* 7(3): 1991: 259-282

This review covers aspects on the benefits offered by poultry irradiation (market-life extension through spoilage delay, control of microbial pathogens of fresh and frozen poultry, elimination of microbial pathogens in mechanically separated poultry meat), regulatory history and current situation, anticipated industry reaction, cost/economics, safety/wholesomeness, detection, process control, eating quality and consumer acceptance. 77 references. SRA

Broilers

1042

Pandey (DS). **Modern scientific method of raising table broilers. Part IV.** *Poultry Guide* 29(1): 1992: 37-46

Duck

1043

Lesiow (T). **Influence of storage time of duck breast muscles at -18 C on rheological properties of gelled tissue and model sausage.** *Die Nahrung* 34(8): 1990: 747-758

The influence of storage time of duck breast muscles at -18 C on changes of rheological properties of gelled muscle tissue and a model sausage was studied for 200 days. Rheological parameters were determined by the TYSZKIEWICZ method and the modified SHAMA-SHERMAN method. On the basis of the calculations of rheological parameters it was found that the eight-element rheological model characterized best rheological properties of gelled muscle tissue and model sausage. The changes of rheological parameters of model sausage are more complex in comparison with rheological parameters of gelled muscle tissue. In both kinds of samples, the changes of rheological parameters are influenced by the changes occurring in myofibrillar proteins as a result of the so called frozen denaturation. It appears, that in the case of gelled muscle tissue it is possible to use exchangeably the TYSZKIEWICZ or SHAMA-SHERMAN method while for model sausage its rheological characteristics based on one of these methods exclusively would be insufficient. The changes occurring in rheological parameters of model sausage cannot be predicted according to the changes in rheological parameters of gelled muscle tissue. On the other hand, these changes are reflected in significantly different values of consistency of model sausage evaluated organoleptically. AS

1044

Lovett (J), Francis (DW), Peeler (JT) and Twedt (RM). **Quantitative comparison of two enrichment methods for isolating *Listeria monocytogenes* from seafoods.** *Journal of Food Protection* 54(1): 1991: 7-11

Two standard enrichment methods followed by the US Food and Drug Administration (FDA) and the US Dept. of Agriculture (USDA) were qualitatively compared for the isolation of *Listeria monocytogenes* from seafoods. With the FDA procedure, KOH culture treatment and enrichment for 24 h provided no advantage for *Listeria* recovery. The FDA procedure isolated heated *L. monocytogenes* from seafoods at a lower level than the USDA method; however, the two methods isolated unheated cells equally well. The greater selectivity of the USDA procedure may offer an advantage for isolating nonheat-stressed *Listeria* when the aerobic plate count of the product is high. BV

Clams

1045

Yellappa (N), Dora (KC), Chanderasekar (TC) and Udupa (KS). **Organoleptic evaluation of clam pickle with certain organic acids.** *Indian Journal of Nutrition and Dietetics* 28(2): 1991: 46-49

Acetic acid and lactic acid treated clam pickle did not show any difference in flavour and appearance; pickle treated with lactic acid had more eye appeal than acetic acid treated clam pickle. The pickle treated with tartaric acid was not appealing. GS

Shrimps

1046

Allen (G), Bruce (VR), Andrews (WH), Satchell (FB) and Stephenson (P). **Recovery of *Salmonella* from frozen shrimp. Evaluation of short-term selective enrichment, selective media, postenrichment and a rapid immunodiffusion method.** *Journal of Food Protection* 54(1): 1991: 22-27

Squids

1047

Yeh (A-I), Liang (JH) and Hwang (LS). **Separation of fatty acid esters from cholesterol in esterified natural and synthetic mixtures by supercritical carbon dioxide.** *Journal of the American Oil Chemist's Society* 68(4): 1991: 224-229

Experimental results showed that cholesterol could be removed from a model mixture (made by adding cholesterol and fatty acid esters together) and from esterified squid visceral oil at low pressure (1500 psig) and high temp. (328.2 K). Under these conditions, cholesterol content in the extract was reduced from 2867 mg/100g to 14.1 mg/100g. BV

1048

Kuo (J-D), Hultin (HO), Peleg (M) and Atallah (MT). **Effects of heating and postmortem aging on physical properties of squid mantle.** *Journal of Food Processing Preservation* 15(2): 1991: 125-133

Physical and tensile properties of Loligo and Illex squid mantles were evaluated during refrigerated storage and after various heat treatments. A major decrease in ultimate tensile strength of the mantle occurred between 50 and 60 C in a direction parallel to the longitudinal axis of the mantle. After storage for more than 4 days at 4 C, the ultimate tensile strength of the mantle decreased significantly in the longitudinal but not the transverse direction. In addition, heating of mantle (100 C for 2 min) stored for more than 4 days led to greater strength loss than observed in heated, nonstored mantle, indicating that refrigerated storage produces changes in collagen that make it more susceptible to the effects of high temp. Strength loss in the transverse direction after heating was observed in mantle of Loligo but not Illex. AS

Fish

1049

Chand (BK), Otta (SK) and Das (SK). **Battered and breaded fishery products - a new attraction in modern food market.** *Seafood Export Journal* 23(9): 1991: 35-36, 38

The steps involved are portioning or forming where small pieces of fillets of fish are formed into portion of various stages and sizes by machine or manually, then it is battered with a paste of water, flour, salt and other flavourings. In breading the fish portions are dropped into a bed of dry crumbs in a breading machine and passed to a flash fryer (into a bath of hot oil) where products remain hot for more than 1 min. Then the product is refrozen before or after packing and stored 30 C. Equipments like forming machines, predusters, liquid enrobers and fryers are used. SRA

1050

Ghosh (S), Alur (MD) and Nerkar (DP). **Hydrolysis of fish protein by *Bacillus megaterium* cells immobilized in radiation induced polymerised wood.** *Journal of Food Science and Technology (India)* 29(2): 1992: 88-90

The immobilization of *Bacillus megaterium* cells in radiation-induced polymerized wood was studied for hydrolysis of trash fish protein. The optimum conditions and reaction kinetics for hydrolysis of protein by free and immobilized cells were found to be similar. Max. hydrolysis occurred at 50 C and at pH 7.5 with 15 to 20% (w/v) of immobilized matrix. The soluble content of the resultant hydrolysate was about 2.4% (w/v). AS

1051

Steiner-Aseidu (M), Asiedu (D) and Njaa (LR). **Effect of local processing methods (cooking, frying and smoking) on three fish species from Ghana. Part 2. Amino acids and protein quality.** *Food Chemistry* 41(2): 1991: 227-236

The effect of cooking, frying and smoking on *Sardinella* sp., *Dentex* sp. and *Tilapia* sp. indicated good quality protein as expressed by high apparent digestibility, true digestibility and net protein utilization and amino acid comp. Cooked fish was better absorbed than fried and smoked. SD

1052

Escobar (FA), Wells (JH) and Waikar (AM). **Simulation based performance analysis of crawfish processing operations.** *Journal of Food Process Engineering* 14(2): 1991: 147-162

A detailed model of crawfish processing operations was developed using the SLAM II simulation language. The simulation model was used to compare overall plant performance for two crawfish cooking schemes, boiling water and steam infusion, and to evaluate processing parameters for different plant capacities. For all the range of operating levels included in this study (2,400 - 19,000 lb of live crawfish/day or 360 - 2,900 lb of tail meat/day), the steam infusion cooking scheme rendered shorter processing times than those required by the boiling water cooking scheme. Moreover, the batch sizes and amount of resources used are smaller for the steam infusion cooking scheme. The simulation model is a valuable tool to analyze the performance of crawfish plants as well as to determine the impact of changes in technology on the overall process. AS

1053

Thibault (C) and Charbonneau (R). **Shelf-life extension of fillets of atlantic cod (*Gadus morhua*) by treatment with ionizing rays. 1. Microbial flora evaluation.** *Sciences Des Aliments* 11(1): 1991: 1-16

Cod fillets frozen (-20 C) for 20 wks and thawed, and cod fillets (48 h post-mortem) are treated with doses ranging 1 - 5 kGy γ-rays and packed in polyethylene bags, with a min. of air. Ionisation of the thawed fillets (1 - 3 kGy) completely inhibits the microbial (*Micrococcus*) growth untill 7 days. In the fresh fillets, a dose of 4 kGy is needed to inhibit microbial (*Micrococcus*) growth at day 0, with a 10^4 level of contamination, while only 1 kGy is needed for thawed fillets with same level of contamination. It is concluded that a dose of 2 kGy allows an optimal increase of the fresh cod fillets shelf-life increasing in from 7 days for control samples to 14 days when treated and kept at 4 plus or minus 1 C. BV

Dhoma

1054

Shankar (TV), Ramachandran (A) and Solanki (KK). **Preparation and shelf-life of semi-dried fish cake from dhoma (*Otolithus* spp.).** *Journal of Food Science and Technology (India)* 29(2): 1992: 123-124

Semi-dried fish cakes from *Otolithus* spp. prepared at 7 and 10% soft levels were assessed chemically and microbiologically. The shelf-life for the two batches were 18 and 24 days respectively. High a_w and subsequent growth of fungi were found to be the reason for decreased shelf-life. AS

Tuna

1055

George (C) and Arul James (M). **Free amino acid composition of white and red meat of tuna (*Katzuwonus pelamis*).** *Seafood Export Journal* 23(9): 1991: 26-27

The free amino acid pattern of the white and red meat of *Katzuwonus pelamis* indicates that both contain all the amino acids. Histidine was in highest amount in both the muscles (162.90 in white and 234.24 in red muscle), followed by glycine, alanine, arginine, tyrosine, glutamic acid and serine in white muscle and arginine, serine, alanine, glycine and glutamic acid in decreasing order in red muscle. SRA

Yellow tail

1056

Berhimpon (S), Souness (RA), Driscoll (RH), Buckle (KA) and Edwards (RA). **Salting behaviour of yellow**

tail (*Trachurus mccullochi* nichols). *Journal of Food Processing Preservation* 15(2): 1991: 101-114

Low-fat yellow tail samples were wet salted in 5, 10, 15, 20% and saturated brine solutions at 25 and 35 C and later desalted. Salt content, moisture, water activity and rate of water transfer assessed showed that brine conc., fish shape and brine temp. had significant effect ($P < 0.01$) on equilibrium salt content and rate of salt uptake. Salt uptake of whole and split fish increase with brine conc. and moisture loss occurred in fish brined in 15 - 21% saturated brine. Rates of salt loss and salt uptake were similar in whole fish while in split fish rate of salt loss was faster than uptake. SD

Products

1057
Scott (KC) and Latshaw (JD). **Effects of commercial processing on fat-soluble vitamin content of menhaden fish oil.** *Journal of the American Oil Chemist's Society* 68(4): 1991: 234-236

Vitamin E level decreased by about half as a result of processing (bleaching and refining). Bleaching the oil with Fuller's earth caused the major loss of retinols. Treating the fish oil with steam for several h caused the major loss of vitamin D_3. BV

PROTEIN FOODS

Infant foods

1058
Bhatt (SN), Shah (AG) and Rana (VA). **Microbiological status of infant foods.** *Journal of Food Science and Technology (India)* 29(2): 1992: 103-104

Microbial quality of infant food available in Gujarat market were found to contain fungi, particularly *Aspergillus*. BV

ALCOHOLIC AND NON-ALCOHOLIC BEVERAGES

Alcoholic beverages

Beer

1059
Basarova (G). **The structure-function relationship of polymeric sorbents for colloid stabilization of beer.** *Food Microstructure* 9(3): 1990: 175-194

This review on the formation of non-biological haze in beer, deals on the mutual interactions of haze causing substances with precipitating, enzymatic and adsorptive stabilizers. Information on morphological, sorptive and filtering properties including structure is presented on new types of polymeric sorbents developed against beer polyphenols. SD

Hop

1060
Clark (DC), Wilde (PJ) and Wilson (DR). **The effect of pre-isomerised hop extract on the properties of model protein stabilised foams.** *Journal of the Institute of Brewing* 97(3): 1991: 169-172

A commercial sample of pre-isomerised hop iso-α acids was found to increase the stability of foams stabilized by bovine serum albumin or β-lactoglobulin as determined by a conductimetric technique under a var. of solution conditions. Suspended thin films containing hop iso-α acids were found to have drainage kinetics and equilibrium thicknesses distinct from control samples. The surface diffusion coeff. of fluorescent-labelled β-lactoglobulin in films partially destabilized by the presence of the non-ionic detergent, Tween 20 was found to be significantly decreased by the presence of hop iso-α acids. These findings support the hypothesis that hop acids stabilize foams by crosslinking surface adsorbed proteins. AS

1061
Kralj (D), Zupanec (J), Vasilj (D), Kralj (S) and Psenicnik (J). **Variability of essential oils of hops, *Humulus lupulus* L.** *Journal of the Institute of Brewing* 97(3): 1991: 197-206

A standard method for distinguishing the essential oils in hops has been developed. Factor, rotation-factor analyses have been used as well as correlation between gas chromatography and organoleptic estimation of aroma. A model for distinguishing 14 groups of oils using 31 descriptors has been developed utilizing the variability of components in essential oils. The results are valid for the oils from older established plants, picked at full maturity in Slovenia. AS

Lager

1062
Griffiths (NM). **Changes in flavour and metal content of lager during storage.** *Journal of the Institute of Brewing* 97(3): 1991: 173-179

Lager was commercially packed into glass bottles and two batches of both steel and aluminium cans. The flavour was evaluated by two sensory techniques and the iron and aluminium measured after 0, 1, 3, 4, 6, 9 and 12 months storage. The triangle difference tests showed no statistically significant difference in 23 out of the 26 tests. Similarly, no overall difference was found, due to pack or time, by quantitative descriptive analysis between any of the samples, canned or bottled. There was, however, a trend with storage time for the odour of all canned samples to increase in cabbage and decrease in fruity, buttery and aromatic attributes; the bottled lager did not show this trend. The iron content of the lager from all bottles, aluminium cans, and the 0, 1 and 3 month stored steel cans was generally less than 0.03 mg/l (the detection limit). From 4 months, the iron content of the lager from both batches of steel can varied markedly can to can and on av. increased; the concn. after 12 months storage varied from 0.03 to 1.43 mg/l. The amount of aluminium found in bottles and both types of can was always less than the detection level of 0.1 mg/l. AS

Wort

1063
Dale (CJ). **Applications of column chromatography to the analysis of brewing raw materials, wort and beer.** *Journal of the Institute of Brewing* 97(3): 1991: 187-195

The applications of column chromatographic methods of analysis to the investigation of the nitrogenous and carbohydrate constituents of brewing raw materials, wort and beer are reviewed. AS

Wines

1064
Correa-Gorospe (I), Polo (MC) and Hernandez (T). **Characterization of the proteic and the phenolic fraction in tartaric sediments from wines.** *Food Chemistry* 41(2): 1991: 135-146

Physico-chemical properties of organic compounds in sediments of wines were studied by electrophoretic, chromatographic techniques and chemical analysis. Phenolic compounds, consisting of cinnamic acids esterified with tartaric acid, were more abundant and highly polymerized in cold stabilized samples. The distribution of mol. wt. of properties of tartrates (50,000) differed from that of proteins in must and wines (20,000 - 40,000). SD

Non-alcoholic beverages

Coffee

1065
Patel (JR), Dave (RI), Joshi (NS) and Thakur (PN). **Coffee whiteners.** *Indian Dairyman* 44(1): 1992: 18-25

Coffee whiteners are used as substitute for fresh milk, in coffee, tea, cocoa or drinking chocolate, soups, sauces, puddings and cereal dishes. The role of each ingredient in the coffee whitener including protein, fat, sugar, emulsifier, stabilizer, buffer salts, flavours and colours have been described. Typical formulations for preparation of liquid and dried coffee whiteners as reported by various workers have been tabulated and the processing steps have been indicated. Whitening power and resistance to flasking are the two main properties of powder coffee whitener which have also been described. SRA

Fruit juices

1066
Dickmann (H). **Crossflow microfiltration system with backwash for the filtration of fruit juice and fruit wine.** *Fluessiges Obst* 56(9): 1989: 538-542 (De)

1067
Wallrauch (S). **Determination of nitrate in fruit juices using the cadmium sponge.** *Fluessiges Obst* 56(9): 1989: 574-576 (De)

Apple juices

1068
Stahle-Hamatschek (S). **Cloud composition and its influence on cloud stability in naturally cloudy apple juice.** *Fluessiges Obst* 56(9): 1989: 543-544, 550-558 (De)

Mango beverage

1069
Vineet Kaushik and Nirankar Nath. **Effect of cooking procedure and variety on acceptability of unripe mango beverage.** *Journal of Food Science and Technology (India)* 29(2): 1992: 127-129

Five cooking procedures were tried with 'Dushehari' var. Pressure cooking whole fruits under 15 psi steam pressure for 20 min, removing peels and stones manually, and passing through a blender

gave highest pulp yield (67.8%) without adversely affecting TSS and acidity of pulp, or sensory qualities of the beverage. Pulp yields for 'Deshi', 'Safeda' and 'Chousa' var. were 35.0, 64.8 and 68.4%, respectively. 'Dushehari' beverage was rated best, followed by 'Deshi', 'Safeda' and 'Chousa' beverages in that order. AS

Soft drinks

1070

Rother (H). **Determination of juice content in soft drinks.** *Fluessiges Obst* 56(9): 1989: 562-571 (De)

Tea

1071

Zakia Bano, Rajarathnam (S) and Mohanty (BD). **Somatic embryogenesis in cotyledon cultures of tea (*Thea sinensis* L.).** *Journal of Horticultural Science* 66(4): 1991: 465-470

A procedure to induce somatic embryos for cotyledons of tea seeds is described. Embryogenic culture was obtained form 70% of tender cotyledons (diam. 3-8 mm, with light brown and yellow seed coat) cultured on Murashige and Skoog's (MS) basal medium, supplemented with 2,4-D (0.5 mg l^{-1}) and kinetin (0.05 mg l^{-1}). A gradient of response to form embyrogenic culture was obtained with maturity of the seeds (cotyledons). More large compact, bulged tissues of variable shapes and sizes were formed in embyrogenic culture, when the 2,4-D concn. was increased in the medium. However, these tissues when cultured separately on a medium low in 2,4-D and kinetin, produced pro-embyronic cell masses and, eventually, plants. Masses of globular embryos formed in embryogenic culture; these retained their growth and morphogenic ability in a maintenance medium, and on transfer to a harmone-free or a medium containing kinetin (0.05 µg l^{-1}) 30% matured to form heart to torpedo shaped embryos. Of these 40% readily germinated on half-strength MS medium supplemented with kinetin (0.05 mg l^{-1}, glucose 1.5%) and activated charcoal (0.2%) to form complete plants. Morpho-histological evidence suggests that somatic embryos developed directly from cotyledon cells. AS

1072

Qiu (ZS), Matsuura (T) and Chan (K). **Reverse osmosis concentration of green tea juice.** *Journal of Food Process Engineering* 14(2): 1991: 85-105

The reverse osmosis concn. of green tea juice was attempted by using membrane prepared from different polymeric materials. The pore sizes of the membranes were also changed in order to investigate the effect of the pore size on the membrane performance. Special attention was focused on the removal of caffeine from the tea juice while retaining other components such as polyphenols and amino acids. Since severe membrane fouling was observed while tea juice was treated at high concn., an attempt was made to describe the membrane fouling by a modified gel model that includes the effect of the interaction between the membrane and the tea juice components. AS

FATS AND OILS

1073

Bariszlovich (M) and Meusel (DTulsnerM). **Characterization of microbial lipases. Part I. Determination of lipase activity.** *Die Nahrung* 34(8): 1990: 701-717 (De)

Review. 123 references. BV

Fats

1074

Gottstein (T) and Grosch (W). **Model study of different antioxidant properties of α- and γ-tocopherol in fats.** *FAT Science Technology* 92(4): 1990: 139-144

A model study using 2,2,5,7,8-pentamethyl-6-hydroxychroman (α-COH) and 2,2,7,8-tetramethyl-6-hydroxychroman (γ-COH) as antioxidants, and linoleic acid and its methyl ester (both in bulk phase) as lipids was performed. After having demonstrated that the antioxidative activities of the model substances did agree with those of the corresponding tocopherols (α-T, γ-T), the stability of α-COH and γ-COH was determined, and the products arising from α-COH, γ-COH, linoleic acid and its methyl ester were identified. α-COH did oxidize to different major products (quinone, trimer) depending on the reaction temp. (37 and 47 C) and the antioxidant concn., whereas the products obtained by oxidation of γ-COH (diphenyl ether dimer, biphenyl dimer) did not seem to be affected by differences in the reaction conditions. It was concluded that γ-T was superior to α-T antioxidant because it appears more stable and, also, being oxidized to compounds which are still effective as antioxidants. AS

Oils

1075

Nasirullah, Ankaiah (KN), Krishnamurthy (MN) and Nagaraja (KV). **Quality characteristics and**

stability studies on edible vegetable oil blends. *Journal of the Oil Technologists Association of India* 23(1): 1991: 10-12

Edible oil blends were prepared by mixing groundnut oil with rice bran oil (GR) and mustard oil with rice bran oil (MR) in the proportion 10:90, 30:70 and 40:60 (v/v) and stored in coloured glass bottles at room temp. for 3 yr and the physical and chemical characteristics were determined at regular intervals. In GR blend the iodine value decreased from 95 to 92.9, saponification value from 189 to 187.9. Whereas an increase was noted in butyrorefractometer reading from 56.8 to 59.3, free fatty acid (FFA) % 0.6 to 2.1, peroxide value 0.4 to 54.8 and Kries colour value 2 to 40. In MR blend the change in values noted are iodine value 99.7 to 94.6, saponification value 182.72 to 181.6, butyrorefractometer reading 58.5 to 60.5, FFA % 0.46 to 1.3, peroxide value 1.0 to 9.5 and Kries colour value 2 to 15 respectively. Silver nitrate precipitation and dinitrophenylhydrazine colour increased with storage time. MR blend was stable upto 2 yr, but strong rancidity developed in GR blend in 9 months. Cloud point and Bellies turbidity temp. test gave inconclusive results. SRA

1076

Sastry (CSP), Gopala Rao (S) and Sastry (BS). **Spectrophotometric determination of butylated hydroxy anisole (BHA) in oils.** *Journal of Food Science and Technology (India)* 29(2): 1992: 101-102

Two simple spectrophotometric methods were developed for the detn. of BHA in commercial samples and oils. The methods are based on the reaction of BHA to form coloured species with either of two reagents, Fe (III) - 2,4,6-tripyridyl-S-triazine or triphenyl tetrazolium chloride. AS

1077

Pokorny (J), Davidek (J), Vierecklova (M), Ranny (M) and Sedlacek (J). **Effect of phosphorylated acylglycerols on the oxidative stability of edible oils.** *Die Nahrung* 34(8): 1990: 719-725

Phosphorylated acylglycerols and their salts containing nitrogen inhibit the autoxidation of rapeseed, soybean, sunflower seed, and hydrogenated rapeseed oils similarly as natural soybean or rapeseed phospholipid conc. (lecithins). The activity is moderate at low concn. levels (0.02 - 0.10%) but well pronounced at higher levels (0.5 - 2.0%), the protection factor being proportional to the concn. of phospholipids. Ammonium salts are more active than lysine and arginine salts which are more active than free phosphatidic acids. Zinc salts have only very low activity, and calcium and sodium salts are inefficient. The activity depends on the quality of oils, and in lesser degree, on the composition of phospholipids. AS

Canola oil

1078

Przybylski (R) and Eskin (NAM). **Phospholipid composition of canola oils during the early stages of processing as measured by TLC with flame ionization detector.** *Journal of the American Oil Chemist's Society* 68(4): 1991: 241-245

Canola oils at initial stages of processing from different crushing plants were analyzed for phosphatides. The major phospholipid components identified and quantified in refined canola oils were phosphatidic acid and phosphatidylinositol. Phosphatidic acid was the main P component identified in solvent extracted canola oil samples. The two-dimensional separation that was used combined classical TLC with quantitation on chromarods in an Iatroscan with a flame ionization detector. Phosphatides quantitated with this procedure ranged from 0.1 to 20 µg with a coeff. of variation of 4.4 to 7.2%. Using the modified procedure, recoveries of better than 90% were obtained for all phospholipids analyzed. AS

Coconut oils

1079

Barrios (VA), Olmos (DA), Noyola (RA) and Lopez-Munguia (CA). **Optimization of an enzymatic process for coconut oil extraction.** *Oleagineux* 45(1): 1990: 35-42

Mustard oils

1080

Vajreswari (A), Srinivasa Rao (P) and Tulpule (PG). **Short-term effects of low erucic acid rapeseed oil and high erucic acid mustard oil on myocardial lipidosis of CFY strain of rats.** *Journal of the Oil Technologists Association of India* 23(1): 1991: 2-5

Rats of CFY strain were fed diets containing 20% groundnut oil, 20% low erucic acid rapeseed oil or 20% high erucic acid mustard oil for 3 days/one wk. Feeding low erucic acid rapeseed oil did not induce growth retardation and fatty infiltration of heart. Further from the presence of erucic acid containing triglycerides in the mustard oil-fed rat hearts and oleic acid rich triglycerides in the myocardium of low erucic acid rapeseed oil-fed rats suggests that dietary monounsaturated fatty acids got accumulated in this fraction. Studies on the development of myocardial of mustard oil fed rats showed remarkable growth retardation, and

significant accumulation of triglycerides and cholesterol, causing myocardial lipidosis. The myocardial lipid profiles of the low erucic acid fed rats were similar to that of groundnut oil fed rats. Mobilization of lipids from the hearts of mustard oil fed animals started after seven days of feeding, which is more apparent in the female rats. It is concluded that the low erucic acid rapeseed oil may not be harmful, when used for short duration, but prolonged feeding may lead to deleterious effects which are of milder degree as compared to conventional high erucic acid containing rapeseed or mustard oils. SRA

1081

Handoo (SK), Gupta (DK), Gupta (S) and Agrawal (TN). **Effect of allyl isothiocyanate content on the hydrogenation of mustard oil.** *Journal of the Oil Technologists Association of India* 23(1): 1991: 13-16

This study was conducted to findout the optimum level of allyl isothiocyanate (AITC) in mustard oil which does not affect the course of hydrogenation. Mustard oil contaning 39.9% erucic acid and 0.32% AITC was refined, bleached and deodorised for 6 h drawing the sample at 1 h interval to get oil having different isothiocyanate content. Oils with different isothiocyanate levels were hydrogenated in the lab. autoclave at 180 - 190 C and 30 psig hydrogen pressure for 4 h using 0.2% Ni as catalyst. During hydrogenation samples were analysed for m.p., iodine value (IV), and fatty acid composition. The graphs of m.p. vs time of hydrogenation and IV vs hydrogenation indicate the progress of hydrogenation at different levels of isothiocyanate. Melting point vs time plots for mustard oils with different AITC content were linear. With decrease in AITC content of oils, m.p. increased for a particular time of hydrogenation. Similar trend was observed for IV drop. When the AITC decreased from 0.247 to 0.081% significantly lowering dehydrogenation time was recorded. At AITC level of 0.208% corresponding to 1 h of deodorization, the m.p. after 3 h of hydrogenation was 37.6 C which is acceptable m.p. of vanaspati. It is inferred from the above data that the tolerance limit of AITC in mustard oil is 0.18 - 0.20% assuming normal hydrogenation time of 3 to 4 h. The fatty acid composition of all the hydrogenated oils at various stages of hydrogenation revealed that the conversion of linolenic acid to linoleic acid and oleic increases with the decrease in AITC content. SRA

Soybean oils

1082

Nieh (CD) and Snyder (HE). **Solvent extraction of oil from soybean flour. I. Extraction rate, a countercurrent extraction system, and oil quality.** *Journal of the American Oil Chemist's Society* 68(4): 1991: 246-249

Rates of oil extraction from either fine flour or soybean flakes in a column showed that oil extraction from flour was dependent on the vol. of solvent, but oil extraction from flakes depended on time of contact rather than vol. of solvent. Fine full-fat flour worked well in a batchwise countercurrent exstraction system with mixing and centrifugal separation. The oil resulting from this countercurrent extraction system had a superior quality with 37 p.p.m. P, 0.08% free fatty acids, and a light colour. BV

1083

Nieh (CD) and Snyder (HE). **Solvent extraction of oil from soybean flour. II. Pilot plant and two solvent extractions.** *Journal of the American Oil Chemist's Society* 68(4): 1991: 250-253

The process of grinding soybeans to a fine flour and extracting the flour with hexane was studied on a pilot plant scale. The crude oil from the pilot plant study had 15 p.p.m. P and was suitable for physical refining after a light acid pretreatment and bleaching. The refined oil showed a Lovibond colour of 1.4 yellow and 0.3 red. The pilot plant study also showed that grinding of the soybeans and the separation of solid from miscella were the most difficult steps in solvent extraction with fine flour. A lab. study on separation of miscella from meal by aqueous ethanol reduced the hold-up vol., but it did not remove all the miscella. A test with β-carotene showed that only the miscella outside the flour particles was displaced. Aqueous ethanol solutions used as a second solvent extracted additional nontriglyceride material (primarily phospholipids) from the meal. Also, the free fatty acid content of the oil was increased with aqueous ethanol solution wash. The quality of the extracted crude oil was lowered by using a second solvent, but it had the advantage of needing only one centrifugation to separate miscella from meal. AS

Sunflower oils

1084

Mittelbach (M) and Trathnigg (B). **Kinetics of alkaline catalyzed methanolysis of sunflower oil.** *FAT Science Technology* 92(4): 1990: 145-148

The kinetics of methanolysis of sunflower oil with KOH as catalyst was investigated. The content of triglycerides, the resulting methyl esters as well as diglycerides and monoglycerides was analyzed at different times at molar ratios of methanol:sunflower oil = 3:1 and 3.3:1. At a molar ratio of 3:1 the kinetic order appears to be second

order in the first minutes, but then the reaction rate decreases rapidly due to the formation of glycerine as a second phase, which leads to a loss of methanol and catalyst. The effect of temp., amount of catalyst and type of vegetable oil formation of methyl esters was examined. AS

SPICES AND CONDIMENTS

1085

Yavas (I) and Rapp (A). **Gas-chromatographical/mass-spectrometrical investigations into the flavouring substances of raki.** *Deutsche Lebensmittel-Rundschau* 87(2): 1991: 41-45 (De)

Flavouring concn. of raki products (aniseed-flavoured liquors) produced through liquid/liquid extraction with trichlorofluoro-methane could be separated on polar and apolar capillary separating columns into numerous components. The different products (yeni, altinbas, kulup) showed similar flavouring patterns varying only in quantitative composition. Tests by means of GC/MS enabled us to identify more than 60 components. Besides typical components of the anise seed (*Pimpinella anisum*), numerous characteristic components of the raw spirits used in manufacture, made from fermented raisins or grapes was also found. AS

Spices

Basil

1086

Baritaux (O), Amiot (M-J), Richard (H) and Nicolas (J). **Enzymatic browning of basil (*Ocimum basilicum* L.). Studies on phenolic compounds and polyphenol oxidase.** *Sciences Des Aliments* 11(1): 1991: 49-62

Cardamom

1087

Raghavan (B), Abraham (KO), Shankaracharya (NB) and Shankaranarayana (ML). **Cardamom - Studies on quality of volatile oil and product development.** *Indian Spices* 28(3): 1991: 20-24

The review covers improving the quality of cardamom volatile oil by fraction collection during steam distillation, column chromatography, solvent partition and adduct formation, preparation of stable cardamom flavour in powder form by encapsulation; and application of cardamom flavour in sugar-cardamom mix, cardamom cola, cardamom chocolate, custard dessert and cardamom-flavoured coffee and tea. GS

Kalazira

1088

Thappa (RK), Ghosh (S) and Agarwal (SG). **Comparitive studies on the major volatiles of kalazira (*Bunium persicum* seed) of wild and cultivated sources.** *Food Chemistry* 41(2): 1991: 129-134

Oil from cultivated kalazira (spice) seed was found superior with higher content of aldehydes, lower content of terpene hydrocarbons (γ-terpene and p-cymene), richer cuminaldehyde (27.3 - 34.1%); p-mentha-1,3-dien-7-al and p-mentha-1,4-dien-7-al (29.6 - 36.8%) than oil from wild source with more γ-terpene (25.6 - 42.9%) and p-cymene (24.0 - 27.8%) and less aldehydes similar to oil obtained from immature seeds of cultivated source. Yield of seeds can be increased four times than the wild source and straw itself contained 1.20% good quality oil. SD

Mango ginger

1089

Srinivasan (MR) and Chandrasekhara (N). **Effect of mango ginger (*Curcuma amada* Roxb.) on lipid status in normal and hypertriglyceridemic rats.** *Journal of Food Science and Technology (India)* 29(2): 1992: 130-132

When 10% mango ginger or a comparable level of 10 mg % curcumin was fed with a normal diet or with a sucrose based hypertriglyceridemic diet to adult female albino rats, significant decreases were observed in liver and serum triglycerides. Both mango ginger and curcumin caused significant decreases in liver total lipids and free fatty acids in rats on the normal diet and in liver wt. and serum total lipids in rats on the hypertriglyceridemic diet. The curcumin-free lipid fraction from mango ginger when fed at 0.3% level (comparable to 10% mango ginger) with either diet similarly decreased the liver triglycerides on both diets, but the liver wt., serum total lipids and triglycerides were decreased only in rats on the hypertriglyceridemic diet. Mango ginger, curcumin or the curcumin-free lipid fraction did not affect fat absorption. AS

Pepper

1090

Suseelappan (MS). **Medicinal uses of pepper in ayurveda.** *Indian Spices* 28(3): 1991: 25-26

1091

Meshehdani (T), Pokorny (J), Davidek (J) and Panek (J). **Effect of lipoxygenases on the lipid oxidation during the storage of poppy seed (*Papaver somniferum* L.).** *Die Nahrung* 34(8); 1990; 769-772

Poppyseed contains nearly 50% lipids, 65 - 73% of their fatty acids consist of linoleic acid, contributing to high nutritional value of poppyseed. Therefore, the content of linoleic acid containing triglycerides is also high. Poppyseed easily turns bitter on storage, and attributed the bitter taste to the presence of free linoleic acid liberated from triglycerides by lipases; the bitter taste of linoleic acid at the 1.0% level was confirmed in oil solutions. Other researchers reported on the bitter taste of linoleic acid oxidation products, particularly various hydroxylic and dihydroxylic derivatives, which taste bitter even in oil solutions. The oxidation of poppyseed lipids proceeds rather quickly on storage, especially in seeds which are damaged in higher degree due to harvest by combine type threshers. For this reason poppyseed lipoxygenases, which are released from damaged cells and come in contact with linoleic-acid containing lipids on storage of damaged seeds is studied. AS

1092

Meshehdani (T), Pokorny (J), Panek (J) and Davidek (J). **Oxidation of free lipids in stored poppy seed (*Papaver somniferum* L.).** *Die Nahrung* 34(8); 1990; 773-774

SENSORY EVALUATION

1093

Stone (H), McDermott (BJ) and Sidel (JL). **The importance of sensory analysis for the evaluation of quality.** *Food Technology* 45(6); 1991; 88, 90, 92-95

This article outlines the differences between the consumers and producers on the product quality, the meaning of the word 'quality' as understood by the consumers, standardization of quality perception through testing and discusses about the model for sensory quality for the detn. of product quality. CSA

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

1094

Maris (P). **Virucidal activity of disinfectants on bacteriophages contaminating inert surfaces.** *Sciences Des Aliments* 11(1); 1991; 17-24 (Fr)

A simple method for ascertaining the effect of disinfectants in the food industry on bacteriophages contaminating inert surfaces is presented. The virucidal concn. were 1 - 5 times higher than the concn. obtained by the quantitative suspension test NF-T-72-181 in 8 commercial compounds and 3 reference products tested. In the presence of milk, the active concn. were 4 - 32 times, even more than 80 times higher than the usually recommended doses. BV

BIOCHEMISTRY AND NUTRITION

1095

Murthy (NK) and Varalakshmi (S). **Biochemical and functional consequences of riboflavin deficiency among school children in Coimbatore and the effect of riboflavin supplementation.** *Indian Journal of Nutrition and Dietetics* 28(1); 1991; 1-5

The impact of riboflavin supplementation on the growth, red cell riboflavin and arm-hand steadiness of school girls aged 9 to 10 yr. was studied. Each girl was supplemented with riboflavin tablet of 10 mg daily. The supplementation was done for a period of 60 days. Riboflavin supplementation had no impact on blood iron and haemoglobin, anthropometry and urinary hydroxyproline. Arm-hand steadiness improved with the supplementation. GS

1096

Paul (SC) and Mathur (BN). **Nutritional requirements of infants having lactose deficiency - a review.** *Indian Journal of Nutrition and Dietetics* 28(2); 1991; 50-62

A review of nutritonal requirement of the lactose intolerant infants including energy, protein, fat, carbohydrate, minerals, vitamins and growth stimulating and protective factors which form the nutritional components of the infant nutrition. Ca and P ratio, Na and K ratio and the Fe requirement in the diet of lactose intolerant infants has also been indicated and it has been concluded that the nutritional requirement of lactose intolerant infants are slightly higher than that of normal infants. GS

1097

Banerjee (S). **Nutritional status of students and calorie requirements.** *Science and Culture* 57(5/6): 1991: 114-119

The study covers the results of dietary surveys conducted in 13 hostels in Calcutta, nutritional status of students of the Presidency College residing in the Eden Hindu Hostel, food intake of adolescent college girls of Rajasthan; food intake of medical college male students of Rajasthan; calorie requirements, body surface area; respiratory quotient; basal metabolic rate in Indians; and energy intake and expenditure of hostelmates of the above colleges. GS

1098

Fukushima (D). **Structures of plant storage proteins and their functions.** *Food Reviews International* 7(3): 1991: 353-381

The importance of the complete amino acid sequence on the molecule of cereal and legume seed storage proteins in a new food development; the biosynthesis and complete amino acid sequence of these storage proteins; the existance of a common structural feature among the major storage proteins of legumes, rice, rapeseed and sesame, which seem to be unrelated, suggesting that these proteins could be related to a common ancestral gene; the mechanisms of some functionalities of plant storage proteins at the molecular level, such as gel formation of soybean proteins and a visco-elasticity of wheat gluten; and genetic improvement of plant storage proteins are the aspects covered in this review. 65 refernces. SRA

1099

Inglett (GE) and Grisamore (SB). **Maltodextrin fat substitute lowers cholesterol.** *Food Technology* 45(6): 1991: 104

A brief report on oatrim, a maltodextrin made from oats and which acts as a fat substitute with the ability to lower blood cholesterol level. Preparation, properties, applications and commercial status of oatrim are discussed. CSA

TOXICOLOGY

Nil

FOOD LAWS AND REGULATIONS

Nil

AUTHOR INDEX

Regd. No. 36729/84

Printed and published by Director, Central Food Technological Research Institute, Mysore 570 013, at CFTRI Printing Press. Editor: Shri K. A. Ranganath, CFTRI, Mysore.